Railway Age Gazette

Including the Railroad Gazette and The Railway Age

PUBLISHED EVERY FRIDAY BY
THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.

CHICAGO: Plymouth Bldg. CLEVELAND: Williamson Bldg.
LONDON: Queen Anne's Chambers, Westminster.

W. H. BOARDMAN, *President and Editor.*
E. A. SIMMONS, *Vice-Pres. & Treas.* HENRY LEE, *Secretary.*
The address of the company is the address of the officers.

EDITORS:

W. H. BOARDMAN, *Editor*	ROY V. WRIGHT	S. W. DUNNING
RAY MORRIS, *Man. Editor*	ERNEST MCCULLOUGH	CLARENCE DEMING
B. B. ADAMS	G. L. FOWLER	F. E. LISTER
S. O. DUNN	WILLIAM FORSYTH	F. W. KRAEGER
BRADFORD BOARDMAN	W. E. HOOPER	H. H. SIMMONS

Subscription, including regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico.....$5.00 a year
Canada.....$6.00 a year
Foreign Edition, London.....£1 12*s.* ($8.00) a year
Single Copies.....15 cents each

Shop Edition and the eight M. M. and M. C. B. Convention Daily issues, United States and Mexico, $1.50; Canada, $2.00; Foreign, $3.00.
Entered at the Post Office at New York, N. Y., as mail matter of the second class.

VOL. XLVIII., No. 14. FRIDAY, APRIL 8, 1910.

CONTENTS

The Railroad Commission of Wisconsin has a large number of traveling inspectors to make reports on the various public utility corporations in the towns and cities of the state. These inspectors naturally go over a great part of the railway mileage of Wisconsin in the performance of their duties. For instance, during a period of eight months one inspector traveled approximately 5,500 miles. Each inspector is furnished with blank forms on which to make a report on the general conditions of service of the railway on which he travels. This report is simply incidental to his regular work of making an inspection of an electric lighting plant, for instance, in some town, which he has to travel 250 miles to get to. His report on the service of the railway is intended to cover the points that a "wide-awake" traveler would note were he taking the journey. It relates to courtesy of employees, cleanliness of stations and the percentage of cases when trains are on time. These reports are taken up by the railway commissioners and by them submitted to the roads. When reports like these are made by intelligent, fair-minded men, without necessarily any other knowledge of the management of a railway than is gained by the every-day traveling man, they should be of great value both to the public of Wisconsin in furnishing them with the data to be used in demanding improvement of service, and to the management of the railways in enabling the higher officers to learn of violations of their orders and of the petty annoyances to which travelers are often subjected without the knowledge of the railway management. The idea of such reports is much the same idea as that embodied in articles that have appeared in the *Railway Age Gazette* on the causes of the unpopularity of railways.

The comparison of 1908 and 1905 earnings made by the Interstate Commerce Commission in the introduction to the bulletin of revenues and expenses of railways in 1908 and 1909, of which an abstract is published in another column, is fairly close as far as gross revenues and operating expenses are concerned. As the commission points out, however, net operating revenue is really the account with which a railway's income statement begins. The commission says that the average net revenue per mile of line for the fiscal year 1908 is below that of both 1907 and 1906, but it does not fall below the corresponding figure for the year 1905. "Should taxes be included in the deductions [before arriving at net] . . . the result for 1908 is only $9 per mile of line below 1905." The use of the word "only" here is rather misleading. Were the railways really earning the profits on their invested capital and on the enterprise and ability put into their management, then operating income, after the deduction of taxes, would not be "only" $9 per mile in 1908 below that for 1905, but it would be *greater* by some hundreds of dollars per mile of line. In 1905 the interest requirements on the bonded debt of railways reporting to Poor's Manual was $1,129 per mile of line, and the total of required payments, including taxes, from net income amounted to $2,942 per mile. In 1908 the interest requirements per mile of line amounted to $1,259, and the total payments from net revenue amounted to $3,801 per mile. Since 1905 such improvements as the Pennsylvania Railroad's New York extension, Chicago track elevation work and the electrification of the New York, New Haven & Hartford, have been carried out without adding any new mileage. In making a comparison, therefore, of the earnings per mile of line it must be borne in mind that with the improvement of each mile of line the railway company must earn a correspondingly larger net income to remain abreast of its own prosperity. Certain it is that the tax commissioners of the various states recognize the increased value of each mile of line. In 1905 railway taxes amounted to $303 per mile; in 1906 to $349; in 1907 to $367; in 1908 to $367, and in 1909 to $382.

A certain railway is doing a piece of track elevation work in which unexpected difficulties were met. Necessary excavation endangered the foundations of adjacent buildings and space was restricted. If the work had been let to a contractor he would have made a careful preliminary examination and provided for the unforeseen. Not so with the railway. The trouble that might have been anticipated came as a surprise. Worry, hurried efforts and overtime were the result. It was costing about $2 per cu. yd. to handle the material, and the bills had risen to an alarming total. Then an experienced contractor's foreman was employed. The cost dropped to 70

cents per cu. yd. The work is well worth description by the *Railway Age Gazette;* but when we tried to get hold of enlightening data about it the meagerness of what was found available was disheartening. Company forces are doing the work, and the collection of efficiency and cost data has not been divorced by the road in question from ordinary accounting. It would seem that the men in charge of the construction departments of railways need to get the contractor's point of view. Accounting is a matter of balancing of income and expenditures. Cost keeping is a measure of and a means to efficiency. Low costs are obtained by study and improvement of methods, of which cost keeping is one; the business of the bookkeeper is merely to show the final result. This is true not only of the construction but of the surveys and location of railways. To the average railway officer all civil engineers look alike. No particular attention is paid to the records of individual men until by fortuitous circumstances they rise above the $1,800 a year grade. The first thing settled is the doing of the work; the second thing the securing of the men to do it. This latter is really of vital importance. Yet men are employed mainly on their claim that they are fit, and "the last hired, the first fired" is the almost invariable rule, the effect being that many good men are let out and poor men retained when slack times come. The bookkeeper shows the ultimate results, but the effect of railway bookkeeping on costs is indirect and usually negligible. The contractor, whose failure on one job may result in complete financial ruin, has a record of every man and keeps in touch with former employees. To him the weekly or monthly wage of an individual employee means much less than the net results he obtains. Whether a young engineer on railway work is competent is apt not to be known except in a very general way. This could all be changed by having each man in charge of work make weekly, or at least frequent, reports on the efficiency of each of his assistants. Then when the time came for the reduction of forces a wise selection could be made of the engineers to be retained. The results would ultimately be manifest in the records of the accounting department. The rule of seniority is good only when it is coupled with some system of selection for retention in service and for promotion. The reduction in the cost of handling excavated material from $2 per cu. yd. to 70 cents per cu. yd., above referred to, was not accidental. It was the result of improved methods; and the cost might have been further reduced, and the effect felt all along the line, if the men accomplishing the reduction had known that their records were being kept at headquarters and that they could and would be rewarded according to their deserts.

THE SELECTION OF LUBRICANTS.

It is an interesting and significant coincidence that at the meetings of two technical associations this winter, the American Society of Mechanical Engineers and the Railway Club of Pittsburgh, there were papers on lubrication and the use of oils, and that, in both cases, the use of the laboratory testing machine was discredited and especial emphasis put upon the value of service tests as the best and most reliable means of ascertaining the value of lubricants for special purposes. No criticism was made of the comparative results of the testing machine, provided it is distinctly understood that they are for testing machine conditions and that what they really show is the "relative lubricative value of oils for the machine itself" under the conditions in which it is operated. For example, it is very evident that the results obtained on a testing machine could not be regarded as determinative of the value of a valve oil that was to be used with high steam pressures in a cylinder, for it might lead to the use of a cheap car oil as best adapted to the purpose. In like manner the testing machine is hardly adapted as yet to the reproduction of the conditions obtaining on car journals. In the machine there may be established a journal pressure corresponding exactly to the static load of the car at rest, and dimensions of axle and brass can, of course, be reproduced; and, when it is in motion, we may even have the travel of the bearing to and fro, but there the resemblance ends. We cannot reproduce the pounding, the variation in pressure and the lurching back and forth that is characteristic of actual work. We cannot reproduce them because we do not know what they are, nor have we more than a glimmering of an idea as to the amount or intensity of these variations; and these variations must have an important bearing on the facility with which the lubricant is carried in between the surfaces, as well as on the character of the lubricant that can be so carried. As the author of one of the papers expressed it: "In valve oils, especially where the action of steam in emulsifying the oil may have great influence on the value of the oil, it is manifestly impossible to make any sensible deduction from such a type of instrument as to the action of the oils in cylinders under working conditions." It was, therefore, suggested that the testing department of a road work out a series of testing machines to duplicate road and working conditions; a suggestion that, in a way, resembles that of belling the cat, for how can road conditions be reproduced until you know what these conditions really are? It comes back then to service tests as a means of determining the value of an oil.

In his paper before the Railway Club of Pittsburgh, A. D. Smith, of the Canfield Oil Co., discussed the value of specifications and showed that the usual tests of gravity, flash, fire and viscosity bore no true relation to lubricating value; but that, when conditions under which an oil is to be used are known, certain conclusions as to its general suitability for the purpose in hand may be derived empirically from a consideration of the tests as a whole. Thus experience has shown that cylinder oils must possess certain qualities of flash and fire tests, about 525°F. and 600°F., respectively, and that there must be a certain minimum of tarry matter. In like manner, engine and car oils should flash and burn at 300°F. and 400°F., respectively, points that may well be embodied in the specifications. Possibly, too, it may be wise to include a minimum viscosity in the specification, but this should be worked out ultimately from service results.

There was, then, a slight inconsistency in first disclaiming the value of a viscosity test and later saying that, possibly, it might be wise to incorporate it in the specifications. This disclaimer and yet admission of the possible value of a viscosity test checks very closely with the paper read before the mechanical engineers, which said that "the value of viscosity as a distinguishing property of lubricating oil is recognized by all who have given attention to the subject, but all are not agreed as to the extent of its practical reliability." And one author suggests that the quality of oiliness or greasiness is of nearly as much importance as viscosity. And, here, we are met by the fact that there are no precise methods by which the quality of oiliness can be determined.

This leaves us somewhat in the air as to why a test should be made and embodied in a specification if we cannot tell what the results may signify nor have any idea as to what use to make of them when they have been obtained. So, it seems, from these two discussions, at least, that the final court for the determination of the value of a lubricant is service. It it, undoubtedly, for that reason that so few roads are willing to experiment with lubricants, and certainly none would be willing to abandon one that had been tried even though the price of another might be made attractive and the laboratory certificate be all that could be desired. It is service that settles it. It is not probable, however, that in oil, any more than anything else, the last word has been said and that the best that can be made for cars or cylinders has been produced. It is trite to say that cost and lubricating qualities are both to be considered. It is comparatively easy to learn the cost of lubrication, but in getting at the real efficiency of a lubricant as a means of reducing the co-efficient of friction under a car,

nothing has yet been done beyond ascertaining that co-efficient on a testing machine and watching the oil boxes to determine the temperatures, methods that cannot be regarded as of scientific exactness for the purpose indicated.

As to viscosity, it is sometimes specified and sometimes not. According to Mr. Canfield, one specification is about as likely to produce good results as the other. Not because viscosity may not be an important quality, but because it does not, necessarily, bear any relation to lubricating power, and that is what is bought. He considers that when it is known that a certain oil is doing the work required in a satisfactory way, it is well to insert a viscosity specification as a check on future deliveries; in other words, use it empirically.

As to the specifications for valve oils, he called attention to the undesirability of any excessive amount of foreign matter, since it points directly to an inferior base or carelessness in refining, or both, and that 1 per cent. in cylinder oils is the upper limit of what should be accepted, since more than this indicates that the oil has been subjected to an excessive temperature.

And finally, while recommending that laboratory investigations should be made of the relations existing between the constants of flash and fire, flash and viscosity, fire and viscosity, sulphur content, action of sulphuric acid at high temperatures, distillation, etc., it is the actual service results that should be most closely watched, and that when all has been said and done, "the whole scheme of selecting a lubricating oil should be service first, then standards, followed by tests and then service."

RAILWAY WAGES AND RAILWAY RATES.

In each of the recent cases in which the western railways and their employees have submitted their differences regarding wages to arbitration, awards of higher wages have been made. Probably the railways will feel constrained to accept these awards as guides for future action. They are apt to lead to many general advances in wages, such as were made last week by the Pennsylvania and the Philadelphia & Reading. All friends of social progress are glad to see the earnings of workingmen increased where this can be done without causing more harm to other interests than benefit to the workers. Railway officers, many of whom have risen from the ranks, are as glad to see their subordinates get good pay as anyone else is or could be. But they always have to remember that they have the interests of others as well as of employees to consider. These others are investors in railway securities and the public.

Their main reason for at first resisting demands for advances in wages were that they felt that railway employees already were being paid as much in proportion as workers in other industries and that the railways under existing conditions could not afford to pay them more. Nevertheless, the raises in wages are being made. In order to enable the railways to stand the increase in expenses and prosper they must be allowed, many of their officers are saying, to increase their revenues by raising their rates.

Railway net earnings are the resultant of numerous forces besides wages and rates. They may increase while wages are going up and rates are going down. They may decrease while wages are going down and rates are going up. The effect which changes in wages and rates have on railway profits depends on the effects these changes have on the efficiency of labor and on the movement of traffic.

There are several forces at work that are tending to increase railway profits and several others that are tending to reduce them. The growth of traffic and the improvements that are being made in plant and methods of operation are tending, the former to increase gross earnings, the latter to reduce operating expenses, and both to increase net earnings. The steady advances in the prices of materials are tending to increase operating expenses and thereby to reduce net earnings. If advances in wages caused proportionate or greater increases in the efficiency of labor, they would not affect, or would reduce, the expenses of operation, and would increase railway profits. But, as a matter of fact, the efficiency of labor has not kept up with the wages paid. It has declined rather than increased, absolutely as well as relatively. In the recent arbitration of the demands of the Brotherhood of Railroad Trainmen, representatives of the employees showed that the tonnage efficiency—that is, the tonnage moved—per trainman had increased 2 per cent. in eight years. But this increase in tonnage efficiency can be more than accounted for by reference to the increases which have been made in the power of capacity of railway equipment. It is the increased efficiency of the machinery they use, and not the improved and increased work of the employees themselves, which has increased their tonnage efficiency.

With various forces working in opposite directions, some of them to increase and some to reduce net earnings, the wisest student of railway affairs living cannot tell what the resultant will be. Most railway managers not only say but sincerely believe that, since the things which are working to reduce net earnings are being reinforced by increases in wages, serious impairment of railway profits can be prevented only by reinforcing with increases in rates the things that tend to maintain net earnings.

The change in rates which is needed to increase railway earnings is not a general horizontal advance but a pretty general readjustment. The notion that a horizontal advance could be made with benefit to the railways and without harm to industries betrays as much ignorance of the fundamental principles of railway economics as does the more widespread popular notion that a horizontal reduction in rates could be made with benefit to industries and without harm to the railways. There are but few rates in the United States that are excessive *per se*. No doubt, however, there are some rates the reduction of which would create traffic that would add less to railway expenses than it would add to railway earnings. This would be of benefit both to the public and to the carriers. On the other hand, there are many rates whose increase would not reduce the volume of the traffic, and, therefore, would benefit the railways without imposing an undue burden on commerce. Some of these rates have been made unduly low to favor large industrial combinations which have had a "pull," and they should be increased both because they yield the railways too little revenue for the services rendered for them and because they are unfairly discriminatory as compared with the rates charged on other commodities handled by small shippers. The western lines have made a good beginning by raising the low rates on dressed meat from the Missouri river to Chicago. It is to be hoped that they and the railways in other sections will have the courage to go ahead and raise other rates which are open to similar criticism. The roads cannot successfully defend advances in rates on commodities handled mainly by small shippers as long as they leave in their tariffs rates made in the interest of large industrial combinations which are proportionately much lower.

Some railway officers think that if the roads are to be required by law and public sentiment to submit their differences with their employees regarding wages to arbitration and to abide by the awards made, the Interstate Commerce Commission, or at least the chairman of the Interstate Commerce Commission and the United States Commissioner of Labor, who are now the official mediators under the Erdman act, should also be made the exclusive arbiters. They would have the responsibility for awarding increases in the wages they must pay for the services their employees render to them put on the same body that controls the charges that they may make for the services they render to others, the shipping and traveling public. Whether this should be done or not, cer-

tainly the commission in regulating the rates of the railways in the interest of the public should take into consideration the fact that the public, in the interest of railway employees, is regulating the wages that the railways must pay, and should co-operate with the roads in the effort to so readjust their charges that they will be able to pay the higher wages fixed and at the same time properly maintain their properties and pay satisfactory dividends to stockholders. The power that regulates should also protect, and this is not in the interest of the railways but in the interest of the public. It is to the interest of the public that railway employees should be well paid. It is to the interest of the public that railway rates should be low. But it is not to the interest of the public that railway wages shall be made so high and railway rates kept so low as to impair the earning capacity of the roads. For whatever impairs their earning capacity will impair their ability to get capital. And whatever impairs their ability to get capital will impair their ability to give the public safe and adequate transportation. We know that this last statement is very hackneyed, but the fact that it has grown hackneyed is, perhaps, the best evidence that it has needed to be said frequently and that it will have to be reiterated many times yet before the public and the railway regulating authorities grasp its true significance.

DELAWARE, LACKAWANNA & WESTERN.

The payment of an aggregate of $22,831,586 dividends by the Delaware, Lackawanna & Western in 1909 and the showing after this payment of a surplus credit account of $27,800,000 on December 31 marks this company as unique among American railways. The underlying reasons for the extraordinary prosperity of the Lackawanna are broadly the conservatism of its capitalization and the location of its coal fields. The company has no bonds or funded debt and has $30,277,000 capital stock, which is at the rate of $37,195 per mile owned and leased. This is an extremely low capitalization when the fact that the company owns extensive and valuable coal fields is taken into consideration. These coal fields lie in the region around Scranton, Pa., and from their situation give the Lackawanna a shorter haul on anthracite coal to tidewater than has any other of the anthracite roads; coonsequently the rate per ton per mile that the company receives on coal is high when compared with the rate received by other companies.

In 1909 the average rate per ton per mile on coal traffic was 8.61 mills; on merchandise traffic the rate was 7 mills. On coal traffic the rate was the same last year as the year before; on merchandise traffic it was less last year by .08 of a mill. As about half of the total tonnage carried by the Lackawanna is furnished by anthracite coal, and more than half of the ton-mileage comes from anthracite coal, this high average rate per ton per mile gives the company about the most profitable traffic that any road could ask for.

The situation of the road, running as it does from New York through Scranton about 146 miles west to Buffalo, 448 miles, is in highly competitive territory. The Lackawanna has facilities for handling a large volume of traffic, and it has a traffic department that is thoroughly aggressive. In 1909 traffic expenses amounted to $650,000, an increase over the 1908 expenses of more than 14 per cent.; but the results as shown by the total operating revenue and by the ton mileage and passenger mileage in 1909 apparently fully justifiy the outlay as a good business investment. The company has succeeded in building up a reputation, both for the prompt handling of freight and for efficient passenger service, that is highly creditable. The passenger traffic department has in the past few years done a great deal of very clever advertising, and the operating department has succeeded in pretty well living up to the claims made for it by the traffic department, which is indeed remarkable. The traffic department has advertised the fast freight service from New York to all points west, and apparently shippers have found this service satisfactory. The traffic department has also persistently advertised the excellence of the passenger service between New York and Buffalo, from which place the Lackawanna has through arrangements to Chicago with the Nickle Plate. The road's reputation is possibly due in part to the success with which the general passenger agent has vaunted the road's superiority and as well to the real excellence of its service.

In 1909 the Lackawanna had total revenue amounting to $34,800,000; this compares with total revenue in 1908 of $32,900,000. Operating expenses amounted to $18,700,000 last year as against $18,600,000 the year before, leaving operating income after the payment of taxes of $15,000,000 in 1909 and $13,200,000 in 1908. After adding other income; after the payment of rentals, and after charging off $2,100,000 for renewals and betterments, the company had a surplus available for dividends of $15,980,000 in 1909. In 1908 the charge for renewals and betterments was $2,800,000 and the surplus available for dividends after paying rentals, etc., was $10,700,000. The company paid 10 per cent. regular and 10 per cent. "extra" dividends, and, in addition, paid an extra dividend of 50 per cent. in July and an extra dividend in stock of 15 per cent. in August.

To comply with the requirements of the commodities clause, as finally interpreted by the Supreme Court of the United States, the Delaware, Lackawanna & Western Coal Co. was formed during the year, and the railway company made an arrangement by which it sells all of its coal at the pit's mouth to the coal company for 65 per cent. of the tidewater price. The stock of the coal company was offered to railway company stockholders at the time of the declaration of the 50 per cent. extra dividend, and it is generally understood that a large proportion of the railway company stockholders availed themselves of the privilege of subscribing for coal company stock at par. As yet there has been no dividend declarations made by the coal company. The railway company still mines the coal and, of course, owns the mines. The agreement as to wages between the coal miners and the operators, which expired in 1909, was renewed for three years more, and President Truesdale says that it may be stated in showing the friendly relations between the company and the men that although there has been no relaxation in the discipline, it has not been necessary to refer a single case in the last seven years to the conciliation board for arbitration.

Of the total revenue last year amounting to $34,800,000, $14,500,000 was derived from transportation of coal. This was less than in 1909 by only about $94,000. The total number of tons of coal carried one mile amounted to 1,679,000,000 tons, the average haul being 186 miles. The ton mileage was only slightly less than in 1908, but the average distance each ton was carried decreased by four miles. The number of tons of merchandise traffic carried one mile totaled 1,627,000,000 tons last year, an increase over the year before of 236,000,000 tons, or about 17 per cent., and the average distance each ton of merchandise freight was carried was 158 miles last year and 169 miles the year before.

The total number of passengers carried one mile amounted to 493,000,000, an increase over the previous year of 5 per cent., and the average receipts per passenger per mile amounted to 1.385 cents in 1909 and 1.374 cents in 1908. This very low average passenger rate is due to the great volume of the Lackawanna's commutation traffic out of New York.

As has been stated, total operating expenses amounted to $18,700,000. Maintenance of way cost $3,300,000, about 1 per cent. less than in 1908; maintenance of equipment cost $4,800,000, or about 1 per cent. more than in 1908. Transportation expenses cost $9,300,000, or just about the same as in 1908. This is a particularly good showing for transportation ex-

penses in a year when merchandise freight traffic ton-mileage increased 16 per cent. and passenger mileage 5 per cent. The large increase under transportation expenses in the cost of locomotive fuel is the result of the company's using more bituminous coal on its freight and switching engines than heretofore. Formerly the smaller sizes of anthracite coal was used for locomotive and freight service, but this coal is now so much in demand that President Truesdale says that the company can better afford to sell these small sizes and use the bituminous coal on its own engines in freight service. The following table shows the unit costs of maintenance:

	1909.	1908.
*Maintenance of way per mile.....	$1,673	$1,710
†Repairs per locomotive	1,732	1,703
" " passenger car	601	603
" " freight car	52	54

*Per mile of first, second, third, etc., track, the cost of two miles of siding and switch tracks being taken as equal to the cost of maintenance of one mile of main track.

†This is for repairs only and does not include renewals, depreciation or superintendence charges.

The expenditure for repairs to passenger and freight cars is about what might be expected on a road like the Lackawanna, but the expenditure for repairs of locomotives appears very small. This is somewhat hard to explain, because unquestionably the motive power of the Lackawanna is kept in first class repair.

The success of the traffic department in securing business is well shown in the comparative statement showing the tonnage of various commodities carried in 1909 and 1908. For instance, the tonnage of grain in 1909 totaled 636,562 tons, an increase of 127,621 tons over 1908; and this notwithstanding the bid that was made for this traffic by the Grand Trunk and other Canadian roads. With the exception of products of animals, the tonnage of nearly all classes of commodities was greater last year than the year before. Naturally the most noticeable increases in tonnage were in the case of building materials and machinery and castings. This was due, of course, to the greatly improved business conditions throughout the country.

The following table shows the results of operation in 1909 compared with 1908:

	1909.	1908.
*Mileage operated	957	957
From coal transportation...	$14,464,221	$14,558,703
Merchandise freight revenue	11,393,860	9,850,008
Passenger revenue	6,825,430	6,449,032
Total revenue	34,815,011	32,898,495
Maintenance of way.....	3,298,389	3,343,396
Maintenance of equipment..	4,797,073	4,747,700
Traffic	651,888	569,398
Transportation	9,340,845	9,312,645
Total operating expenses.....	18,745,509	18,623,655
Taxes	1,394,500	1,180,800
Operating income	15,039,687	13,249,939
Gross corporate income.....	23,513,595	18,930,191
Rentals and interest	5,434,946	5,451,463
Renewals and betterments....	2,099,454	2,781,603
†Dividends	5,831,586	5,240,000
Surplus	10,147,600	5,457,125

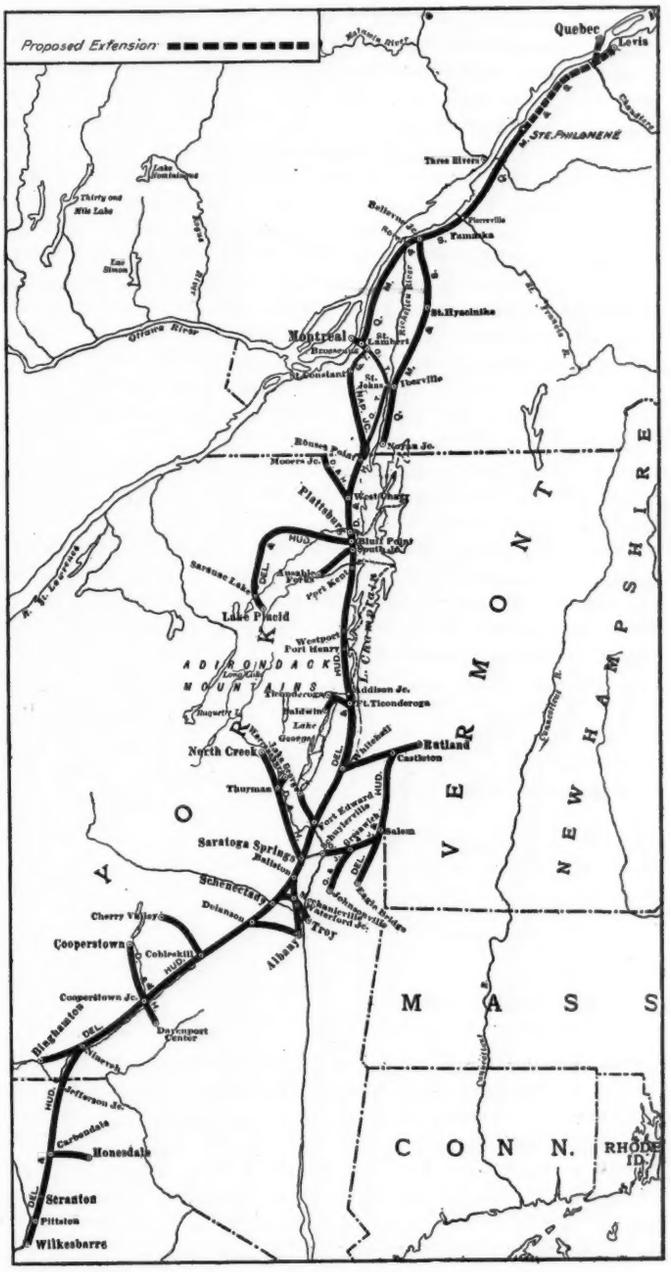
*This is the total mileage of the D., L. & W. system, and includes mileage of controlled and operated roads.

†This is the regular dividend of 10 per cent., and the regular "extra" dividend of 10 per cent. only. The 50 per cent. cash dividend and the 15 per cent. stock dividend were charged to profit and loss.

DELAWARE & HUDSON.

Both the policy of the former management of the Delaware & Hudson in expanding the road by the purchase of the Quebec, Montreal & Southern and the purchase of a number of interurban electric railways, and the policy of the present management in financing these extensions have been apparently justified. The Supreme Court, in overruling a decision of the New York Up-State Public Service Commission which refused to sancation the issue of Delaware & Hudson first and refunding mortgage bonds to reimburse the company for expenditures in the acquisition of coal lands and of electric railways, justified the present management in its contention that regardless of the details and good judgment of the original purchasers, it was proper for the company to make the best use it could of its new properties and to issue bonds to cover their original cost.

The policy of buying these properties at all was justified by the showing of earnings made in the calendar year 1909. The year was one of depression in the anthracite coal trade, and the railway company had to depend on its earnings from merchandise traffic and from passengers to make up for the loss it suffered in the falling off in anthracite coal traffic. Total revenue in 1909 amounted to $19,500,000, an increase over 1908 of a little over $1,000,000. This result was obtained



Delaware & Hudson.

notwithstanding that the earnings from coal freight traffic amounted in 1909 to $8,300,000, or about $800,000 less than in 1908. Previous to 1906 the D. & H. had extended north no further than the international boundary. At that time the company bought the entire capital stock of the Quebec, Montreal & Southern and acquired a number of electric railway properties; and also bought considerable tracts of coal land. The purchase of the Quebec, Montreal & Southern, which has now been extended as far as Fortierville and was put in operation June 14, 1909, and the purchase of the street railways were largely protective measures. The company's

heavy coal haul is, of course, north, and it has needed traffic bound south to balance the loaded car mileage northbound. By the purchase of the Q., M. & S. the management was able to protect the woodpulp industries located on its line and secure accordingly a considerable tonnage of lumber southbound. The purchase of the street railway properties was probably to protect passenger earnings as well as to acquire properties that should become profitable in themselves. These objects, it is evident from the annual report for the year ended December 31, 1909, are being successfully carried out. Passenger earnings amounted to $2,800,000 last year, an increase of $140,000 over the year before. The earnings from electric lines showed substantial improvement. The total increase in net earnings of the United Traction Co., the Hudson Valley Railway Co., the Troy & New England, the Schenectady Railway and the Plattsburg Traction Co. was $298,877. Four per cent. dividends were declared on the stock of each of these electric railways with the exception of the Hudson Valley Railway. The Delaware & Hudson received $1,088,014 dividends and interest on securities owned in 1909, as compared with $803,599 in 1908. The valuation of stocks and bonds owned, as carried on the balance sheet, was $23,588,806 in 1909. This figure is greater by only about $200,000 than the valuation as carried on the 1908 balance sheet. There is no information given as to the cost of these stocks and bonds, or as to the cost of the coal lands purchased, so that it is impossible to judge of the business wisdom shown by the former management in making the purchases; but it is evident that if the stocks and bonds pay over 4½ per cent. in dividends and interest, they are now carried on the balance sheet at a fair valuation.

The annual report of the Delaware & Hudson is a model in respect to completeness and frankness with which traffic statistics and operating results are shown. The following table shows the tonnage of the various classes of commodities and the ratio of this tonnage to the total:

	1900.	1908.	1909.
Products of agriculture:			
Tonnage	1,176,354	792,319	1,027,131
Per cent.	9.63	4.50	5.76
Products of animals:			
Tonage	137,359	210,096	214,722
Per cent.	1.09	1.19	1.21
Products of mines:			
Tonnage	8,030,343	12,206,034	11,171,637
Per cent.	65.79	69.31	62.70
Products of forests:			
Tonnage	513,252	789,402	976,244
Per cent.	4.20	4.48	5.48
Manufactures:			
Tonnage	1,549,778	2,207,754	2,533,282
Per cent.	12.69	12.54	14.22
Merchandise:			
Tonnage	196,313	351,741	438,848
Per cent.	1.68	2.00	2.46
Miscellaneous:			
Tonnage	600,908	1,052,364	1,455,600
Per cent.	4.92	5.98	8.17

The showing made by the tonnage of products of agriculture is particularly good, because there has been during the past year keen competition for the movement of grain, especially by the Grand Trunk and by the New York, New Haven & Hartford; and the securing of a grain tonnage amounting to 450,369 tons in 1909 as compared with 316,012 tons in 1908 is an indication that the D. & H. is able to justify its extension into the territory of the Canadian roads. Both the movement of grain tonnage and lumber tonnage, which latter, it will be noted, showed a substantial increase in 1909 over 1908, is in the right direction, that is, south.

The resulting improvement in loaded car mileage as compared with empty car mileage is marked. In 1908 the total freight car mileage amounted to 136,334,072 miles, of which mileage 49,180,713 miles were made by empty cars; in 1909 the total freight car mileage was 146,899,067, of which only 48,419,358 miles were made by empty cars. There was an increase in the northward loaded mileage of about 5,000,000 miles, with an increase of only about 800,000 miles in the empty northward mileage; while in the southward movement there was an increase of about 6,000,000 miles in the loaded movement, with a decrease of nearly 2,000,000 miles in the empty movement.

The number of tons of all commodities, including anthracite coal, carried one mile totaled 2,491,000,000 in 1909; this is an increase over 1908 of 256,000,000. The average number of miles each ton was carried was 134 in 1909 and 121 in 1908. The average earnings per ton per mile were 6.7 mills in 1909 and 7.1 mills in 1908. It is rather interesting to note that the average length of haul has steadily increased since 1900, the average being 94 miles that year, and every succeeding year showing an increase with the exception of 1908, in which year the average remained almost the same as the year before. The average earnings per ton per mile, however, was 7.9 mills in 1900, decreasing steadily down to 1906, then beginning to increase again. Although the revenue from freight traffic was 82 per cent. of the total revenue, passenger traffic on the D. & H. is important, because of the future possibilities of developing a considerable through traffic between New York and Quebec.

The Quebec, Montreal & Southern is to be extended to a point opposite Quebec as soon as the Canadian government decides definitely on building the Quebec bridge. The D. & H. will then offer, in connection with the New York Central from Albany, the shortest route between New York and Quebec.

The number of passengers carried one mile in 1909 totaled 134,946,143, an increase over 1908 of 7,922,645; and the average number of miles each passenger was carried was 20, an increase over 1908 of a little less than a mile. The average receipts per passenger per mile were 2.1 in 1909 and 2.12 cents in 1908.

Total operating expenses were greater by $650,000 in 1909 than in 1908 and totaled $11,460,000 last year. The cost of conducting transportation accounted for $300,000 of the increase in expenses and totaled $6,800,000 in 1909. There were some economies made, as shown by the detailed list of expenditures under cost of transportation; but in general, since neither wages nor materials were cheaper last year than the year before, it cost proportionately more to move a greater volume of traffic. There is one item that is especially noticeable. Fuel for road locomotives cost $1,594,047 in 1909; this is $140,427 more than was spent in 1908. This is notwithstanding that the miles run by all locomotives were sligtly less in 1909 than in 1908, the passenger locomotive mileage showing a decrease and the freight locomotive mileage showing an increase. The annual report of the Delaware, Lackawanna & Western, reviewed elsewhere in this issue, says that the D., L. & W. found it more profitable to sell the small sizes of anthracite coal that it had been in the habit of using for fuel in its freight locomotives and to use instead bituminous coal, and it would be interesting to know whether the same thing was done in the case of the Delaware & Hudson. As a whole, maintenance of way cost $1,334,546 in 1909 and $1,417,319 in 1908; and maintenance of equipment cost $2,598,566 last year and $2,219,543 the year before. The following table shows the unit costs of maintenance:

	1909.	1908.
*Maintenance of way, per mile	$972	$1,050
†Repairs per locomotive	2,821	1,909
" " passenger car	275	274
" " freight car	44	46

*Per mile of first, second, third, etc., track, the cost of two miles of sidings and switch tracks being taken as equal to the cost of maintenance of one mile of main track.

†This is for repairs only and does not include renewals, depreciation and superintendence charges.

In studying the expenditures for maintenance and for additions and betterments, as well as for new equipment, it must be borne in mind that in the past few years the company has been spending large sums for double-tracking and for other improvements. For instance, its entire road, both single and double track, is equipped with automatic signals. Last year was one in which coal traffic fell off, and apparently it was not found necessary to buy any new equipment nor to increase the expenditures for maintenance of way and

structures. A contract was made, however, during the year with the American Locomotive Co. for the purchase of six Mallet articulated compound locomotives, and these locomotives will be available for service during part of 1910.

There is no mention made about additions and betterments made during the year and charged to income account. There was, however, $720,459 spent on new construction in 1909, and apparently this sum was charged to capital account.

The annual report of the D. & H., while very frank and complete as to traffic and operating figures, does not give details of its profit and loss account. In the annual report for 1908 the balance sheet of December 31 shows "general profit and loss being excess of assets over liabilities" of $11,827,598. The balance sheet of December 31, 1909, shows general profit and loss of $11,079,486 for that date and gives a comparison with 1908 showing $11,525,205 for December 31, 1908. Probably through the new requirement of the Interstate Commerce Commission there was made necessary some change in the method by which the balance sheet was made up, which accounts for this apparent discrepancy. During the year the company sold $7,395,000 first and refunding bonds at a discount of $286,009, which discount was charged to general profit and loss account. Loans payable, which amounted in 1908 to $8,500,000, were reduced during the year to $4,325,000. The cash on hand in 1909 amounted to $1,850,765, as against $830,919 in 1908. This is a rather small working capital, since in 1909 the balance sheet shows interest, dividends, etc., accrued amounting to $1,076,952, comparing with interest accrued of $613,785 in 1908. Bills and accounts receivable totaled $5,803,758 in 1909, an increase over 1908 of $1,430,480.

The following table shows the earnings and expenses in 1909 and 1908:

	1909.	1908.
Mileage operated	843	845
Coal freight revenue	$8,311,479	$9,106,820
Merchandise freight revenue	7,691,617	6,162,181
Passenger revenue	2,834,628	2,693,672
Total operating revenue	19,525,859	18,500,731
Maintenance of way	1,334,546	1,417,319
Maintenance of equipment	2,598,566	2,219,543
Traffic	227,347	204,849
Transportation	6,821,392	6,528,112
Total operating expenses	11,458,480	10,811,721
Railway taxes	411,468	413,029
Operating income	7,655,912	7,275,982
Net earnings coal department	507,875	1,145,418
Gross corporate income	9,980,531	9,926,075
Net corporate income	5,194,840	5,254,458
Dividends	3,825,090	3,816,000
Surplus	1,369,750	1,338,458

Letters to the Editor.

TRAIN RESISTANCE ON THE VIRGINIAN RAILWAY.

Iowa City, Iowa, March 30, 1910.

To the Editor of the Railway Age Gazette:

Mr. Sanderson's reply (*Railway Age Gazette*, March 25) to my note published in your issue of February 25 only partially explains the difficulty mentioned. I trust it is not out of place to call attention to what on its face is an example of remarkably low train resistance. The new formula of the committee on economics of railway location of the American Railway Engineering & Maintenance of Way Association would give a resistance between 40 and 50 per cent. greater than that apparently obtaining with the 100-car train on the Virginian Railway. The Pennsylvania Railroad formula, which seems to give a less resistance than any of the others that have been suggested, indicates a resistance considerably in excess of that apparently obtaining on the Virginian Railway. And the Baltimore & Ohio tests and the resulting formula also indicate a very much higher resistance than that apparently obtaining on the Virginian Railway. If the observations have all been correct and if it is a fact, as supposed, that the grades are too long to be operated in any degree by stored energy, then this performance is particularly worthy of note as indicating a lower train resistance than any heretofore published experiments or formulas indicate to be usual.

WILLIAM G. RAYMOND,
Dean of the College of Applied Science, State University of Iowa.

WASHING WINDOWS.

Altoona, Pa., April 1, 1910.

To the Editor of the Railway Age Gazette:

Being a regular reader of your journal, I noticed in your issue of April 1 a cut illustrating a device for washing windows, claimed by Geo. R. Stanton, of Decatur, Ill., as inventor and owner. This device was used in the boiler department of the Altoona machine shops about 12 years ago. We certainly agree with him that it is all right, but the idea was conceived by me, who was assistant foreman of the Altoona boiler shop at that time.

J. B. TATE,
Foreman Boiler Department, Altoona Machine Shops.

[Mr. Tate's letter approves of the device and brings up a question which we cannot answer and are not interested in.—Editor.]

LOCAL PASSENGER TRAFFIC.

Chicago, April 4, 1910.

To the Editor of the Railway Age Gazette:

The question of how to meet the competition of electric lines for local passenger business is receiving more earnest consideration by managers of steam railways than ever before. For a time the tendency was to submit to the loss of all the local business—in other words, to let the electric lines have all the local traffic and be content with the operation of through trains between the larger cities of the country, except, perhaps, a couple of local trains daily in accordance with the franchise requirements. But the managers of steam lines have recently awaked to the fact that the suburban lines are not content with local business alone, but are reaching out for through business. For that reason motor cars as a means of keeping and regaining local traffic are, I believe, going to be rapidly placed in service by many steam lines.

It is indeed well that some means has been devised whereby the steam roads may compete on a high plane with the modern interurbans that are forming such a network of lines throughout the country, especially in the central states. I have given considerable thought to the seemingly poor policy of the steam lines in sitting idly by and permitting their business to be taken from them without the least resistance, except perhaps a fight over a country crossing or a city switch. I am not severe in my condemnation of what may have occurred in this respect four or five years or longer ago, but since the remedy has been at hand for the past three years, there is really no excuse, and I am at a loss to understand why the steam lines have failed to grasp the true situation.

In nearly every case they have the short line, and yet interurban competition has sprung up. By maintaining equally frequent service the steam roads would get 75 per cent. of the local business. Why? There are several reasons. First, Americans want fast time, and a much better schedule can be made on steam tracks. The use of city streets, street stops and city street railway crossings are avoided, thus permitting top speed up to the station both in and out of the cities and through villages. The cars in steam trains have more seat space, or rather, elbow room, better toilet facilities; and steam lines look well to the care of baggage, which the interurbans fail to do. For these reasons and others 90 per cent. of the traveling public prefer to ride on a steam road. As I have said, "time" is the all-important factor with us Americans, but I must add "convenience." The old-time policy of the steam lines in providing only a morning and an evening train, unless additional ones earned exactly as much, was not enough. Along came the interurban with its hourly service or better, and what was the result? Capacity of the interurbans taxed to their limits and the practical discontinuance of purely local service by steam lines.

It is only within the past few years that interurban promoters started the idea of building new or extending short city lines across country to a neighboring city or village, and little did they care how they got there, how the road was

built or managed, or what broad franchises were forced upon them. They were primarily 5-cent fare fellows, but wise enough to see into the future. Accordingly, a piece here, an extension there, and almost before we were aware of it, we were patronizing and booming a new industry in direct competition with the old steam lines. The managements of the steam lines sat and dreamed and wondered, watched a big reduction in fares, noted the frequent service given, which was the method used in wresting from them all their local business, and did nothing.

The steam lines couldn't exist—so they said—on anything less than the 3-cent rate, and when called upon by municipalities, boards of trade, etc., for better service they couldn't afford to give it. The capitalists began to put their money into electric lines, to abandon the old highways, to build on private rights-of-way, eliminate curves, lay heavy steel, build steel bridges, grade, erect commodious stations in cities and convenient shelter shops in the country, to buy a piece of line here and a piece there, until now an interurban road of 100 miles length is not of sufficient importance to gloat over.

Then came their limited cars, through interline ticketing arrangements, the formation of a Central Electric Traffic Association with a permanent chairman, and the publication of a through joint selling and basing fare sheet, covering a membership representing some 2,500 miles of line.

They have shown that it is possible to carry passengers for two cents and less, and this all helped to bring about legislation for 2-cent fares, which the steam lines had to adopt, but which a few years ago they "couldn't afford" to grant.

I have mentioned casually only a few of the more important things that have happened in recent years, showing how the local business of the steam lines received its death blow. The interurbans are now adopting the policy wherever possible of raising all their fares to the 2-cent basis, knowing that with even the same rates as the steam roads they will get the local business, and in addition, by giving a superior service, a goodly portion of what might be termed "through."

Now, the point I am getting to is the fact that the steam road is here to stay. There is still some virgin territory left open not yet invaded by interurbans, but which will see such lines very shortly, as evidenced by surveys that have been and are being made. The steam lines must surely have knowledge of this condition of affairs.

By adopting the motor car such steam lines as still have territory open will not only retain for themselves all the local passenger business, but effectually prevent competition in freight traffic, which is an all-important factor.

I heartily favor these single unit motor cars for use on steam tracks for several reasons:

They can be run in between through trains to handle local traffic.

They can pull one or two trailers, if necessary, thus handling a large crowd at a given time.

They can do switching service.

They can be put on lines where the conditions of travel vary. Many steam roads operate lines the summer traffic on which taxes their capacity. The handling of local business to lakes or resorts is a serious problem if they would handle the people satisfactorily. In the winter a meager service on these lines answers all requirements. The expense of any steam service that might be given is out of proportion to the profits. This is not true of motor car service. Interurban lines, when not advised in advance of any large crowd for a particular movement, must seriously inconvenience passengers unless superintendent or despatcher can find an idle crew and an extra car handy to run in and help out.

Each motor car being its own power house, it is not necessary to operate a huge plant at a large expense, as the interurban must do, to provide for a certain party in one car a short distance after the usual closing hour. The motor car is built to carry one-third more passengers than the ordinary interurban can, and, as it will also handle on schedule time two or three trailers, the company is always in a position to take care of large parties that desire to travel together, mingling en route and all arriving at destination at the same time, all that is necessary being to have on the siding at each terminal two or three regular standard passenger coaches, which can be backed up, coupled and started out as a three or four car train if necessary, without loss of time, the coaches being returned when convenient.

About the most important feature is that should one motor car fail, the service of that one car only is lost. When the power-house of an interurban line is crippled or a trolley wire fails, the entire line is tied up until repairs are made.

Capital would be hard to find for investment in a trolley line parallel to a steam line that had motor cars in use. When the promoter informed his man of money that the steam line he proposed to parallel either had, or was about to institute hourly, or bi-hourly, service, I am afraid it would be exceedingly hard to convince the capitalist that a competing line would pay.

I know of one case where an interurban line was built between two important cities on which an hourly service is now maintained in addition to limiteds. It does an average business each day of about $700. Does that mean anything? Well, if $225,000 annually means anything, why, that is the answer. The competing steam line was importuned to adopt motor car service and keep all this business, but it thought it impracticable. I am safe in saying that capital could not have been secured for the interurban line had the steam road announced an interurban service, which could have made the run between the two cities mentioned 45 minutes faster than it is made by the present interurban line. The steam line could have purchased five or six gasolene motor cars and installed them while the trolley people were thinking about it, and even then had the trolley line succeeded in building, the business would have gone to the line whose cars made the run in three-quarters of an hour less time.

In 1907 I put a motor car proposition up to a steam line to head off the building of an interurban competitor. The manager laughed and said I was impractical. To-day he is considering the adoption of such a service, and I am sure that if the motor service is inaugurated it will spell doom for the trolley line.

It is needless for any steam line operating officer to say that owing to through freight and passenger train service over his line the operation of such a service is unpractical. More cars (limited locals and freights) are daily being operated over certain single track interurban lines than some steam lines handle in a week, and it is accomplished, too, by persons of less operating experience than the steam lines usually have. Sufficient passing tracks and intelligent despatchers seem to be the requirements.

My sixteen years of close application to the passenger business from a general office standpoint, ten of which have been with steam lines and six with interurbans, has enabled me to give this subject considerable study, and it is with a certain degree of pride that I still retain that steam line feeling, which we all know lingers in the mind of a one-time steam railway man. It was because of this that I undertook the study of what may be accomplished by the steam roads with the adoption of the motor car.

If I have, by my remarks, been able to awaken to any extent the minds of any steam railway officers who would broaden their field of activity and regain for their property its rightful and just share of the ever increasing local passenger traffic, I will feel amply repaid. Data as to the cost of equipment and operation of electric lines and as to new lines which it is proposed to construct, I would be glad to furnish on request.

G. M. H.

Contributed Papers.

SUBAQUEOUS TUNNELS.*

BY R. B. WOODWORTH,
Engineer with the Carnegie Steel Company, Pittsburgh, Pa.

V.

THE SHIELD METHOD.

Lining. Since the days when Greathead built the Tower tunnel, practically all subaqueous railway and passenger tunnels have been lined with cast iron. The Thames tunnel, built by Brunel, was lined with brick in cement by bricklayers who placed them directly from the platforms of the tunnel shield. The bricks were thus laid as the shield advanced, nevertheless there was always an unprotected space between the brick lining and the shield through which water and silt might pass into the tunnel. The Severn tunnel and the Mersey tunnels, built in 1873 to 1886, were also lined with brick laid in cement, but these two were rock tunnels—subfluvial but not subaqueous.

Apart from its longitudinal weakness, one great disadvantage in brick lining is the necessity for centers on which to construct the arches. These can be made moveable, but only serve to crowd space already well filled and in so far interfere with the progress of the work. In some cases, however, brick lining is most desirable and water works and drainage tunnels are properly lined that way, whether driven with shield or without. The Flushing tunnel for the Gowanus canal in Brooklyn, for example, is so lined. This tunnel, 6,270 ft. long, is circular with an inside diameter of 12 ft. and is lined with four rings of brick laid in cement, making a wall 16 in. thick at all points. The tunnel was driven from two headings by the shield method under compressed air at 7 lbs. pressure. Each shield was 15 ft. long and 14 ft. 8½ in. in diameter and weighed, with its jacks, etc., about 55 tons. The length of the shield was somewhat more than is common in tunnels of approximately the same diameter and the rear end projected 5 ft. 10¾ in. behind the back diaphragm to form a tail piece, inside which the brickwork was built. The shield was equipped with fourteen 140-ton Watson-Stillman jacks with automatic drawbacks. These jacks had 8½-in. pistons, 36-in. stroke and reacted against a heavy cast iron ring which covered the entire face of the brickwork and distributed the pressure over it. This ring was attached to the rams of four of the jacks and when the rams were drawn back after making a shove they carried the ring with them. The centering ribs consisted of four segments of two 4-in. x 3-in. angles riveted together so that each angle projected a foot beyond the other on opposite ends to allow for joining the segments together. The ribs were circular and both ribs and lagging went all the way around. The bricklayers laid the lagging up to the spring line as fast as they laid the brick, and this protects the green brickwork from damage due to walking upon it. The usual time for two bricklayers to complete a 34-in. ring of brickwork was 4½ hours, so the progress of the tunnel was limited to the rate of setting the brickwork. Average progress of each shield was 11 ft. in 24 hours.

Fig. 13 shows the cross-section of tunnel and detail of cast iron lining of the Pennsylvania Railroad's New York tunnels. This lining is of the usual tube type as developed in the light of experience and may be considered as the embodiment of modern tunnel practice. In addition to the standard cast iron lining, cast steel rings of the same dimensions were provided for use in a short stretch of the tunnel when passing from rock to a soft ground foundation, where it was anticipated that unequal settlement and consequent distortion and increase in stress might occur. The rings were 30 in. wide and composed of 11 segments and a key. Each segment weighed approximately 2,020 lbs. and the key 520, the total weight being 9,102 lbs. per lineal foot of tunnel. Each segment is stiffened to resist the back pressure of the jacks by two ribs to the rams, but the ram pressure is applied through the heads on each side. These ribs do not come into any fixed relation over at least one rib at any possible position.

Just as in coal mining operations the size of mine timbers is fixed by judgment and experience, so the thickness and form of the cast iron segments seem likewise in the ultimate analysis to be based on experience rather than on mathematical calculation. The length of the rings in the Tower subway was 18 in., in the St. Clair Tunnel 18¼ in., in the

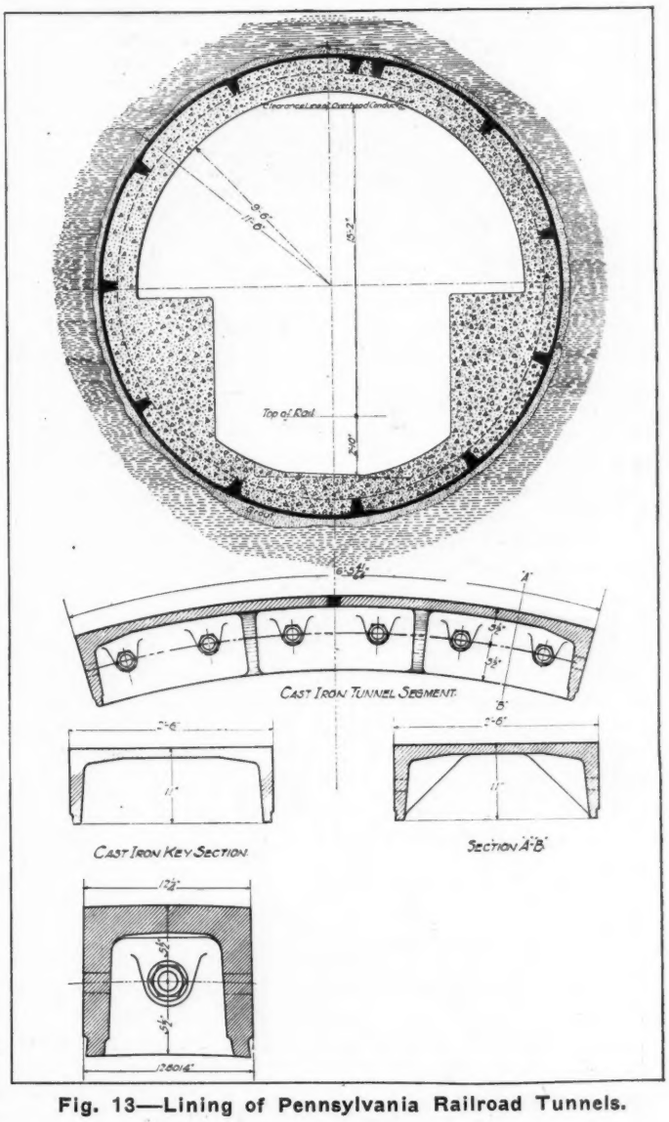


Fig. 13—Lining of Pennsylvania Railroad Tunnels.

City & South London Railway tunnel 18 in., 19 in. and 20 in.; in the Hudson tunnels of the Hudson & Manhattan, 20 in. and 24 in.; in the Blackwall tunnel the length was increased to 30 in. and the same dimension has been followed by the Pennsylvania Railroad. The length is a matter of convenience. The longer length means a greater shove of the shield, less time spent in moving equipment and consequently greater economy in construction. The longer length, however, means increased weight of segments, greater thickness for the same strength and heavier erecting equipment. It has been said the thickness is a matter of experience. This is borne out by the history of the Hudson river tunnels of the Hudson & Manhattan. The cast iron lining at the start had an inside

*From a paper read before the Railway Club of Pittsburgh.

diameter of 18 ft. 2 in. and an outside diameter of 19 ft. 6 in.; each ring was 20 in. wide, composed of 9 segments and a key. These segments were 1¼ in. thick in the web, with flanges 8 in. deep and 1½ in. thick, and the points were not planed. On account of the appearance of serious weakness a new and heavier lining was substituted after 286 rings were in place. In the new type all joints had planed faces, the ring was composed of 11 segments and a key and the thickness was increased to 1½ in. with 9-in. depth of flange. After 380 rings of this type were placed, the design was again changed; the depth of flanges was reduced to 8 in., the web remained 1½ in. thick, but the flange thickness was increased to 2¼ in.

One of the recommendations of the cast iron segment has been the cheapness of the material of which it is made. This

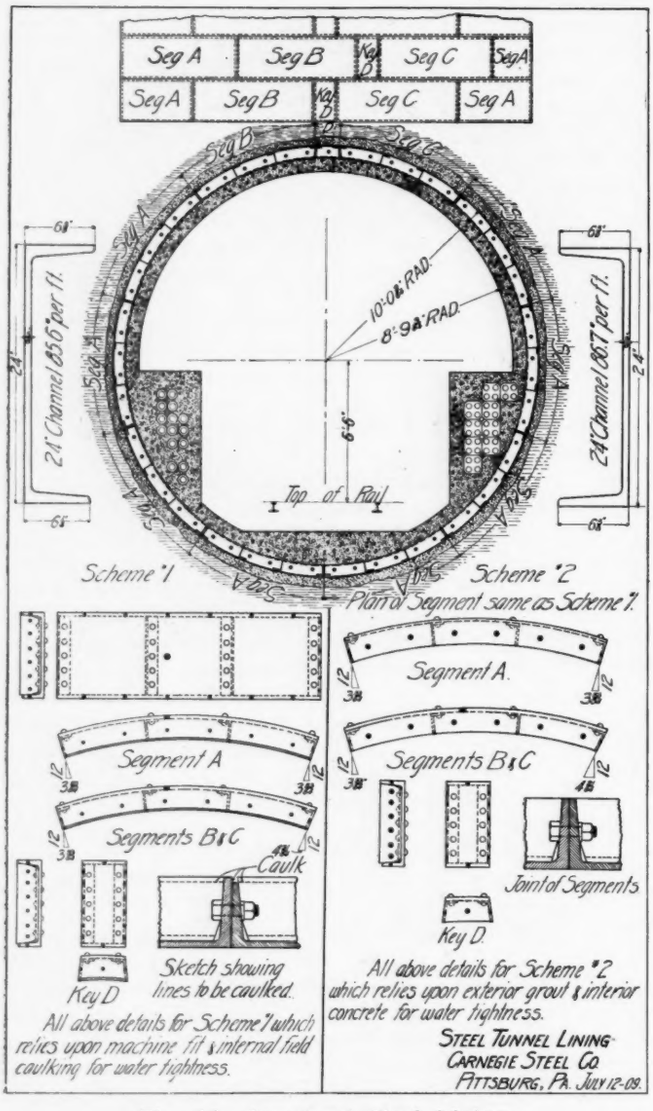


Fig. 14—Structural Steel Lining.

cheapness is offset in modern practice by the machine work on all four sides necessary to provide the fineness of workmanship demanded by considerations of watertightness, and endeavors have been made to devise some means to avoid it. As noted, in the first Hudson tunnel work the joints were not faced and this probably constituted one element of structural weakness. Henry Japp, managing engineer of S. Pearson & Son, Inc., has covered by letters patent a pressed steel tunnel segment of much merit. Pressed steel equipment has not yet, however, reached the development necessary for the production of so accurate workmanship, and the equipment suitable for this work would of necessity be heavy and expensive. Moreover, the segments would either need to be short, which would mean more time in erection, or if of the same length as the cast iron would need to be stiffened by angle iron stiffeners to resist the ram pressure.

Structural shapes and plates, however, are the logical successors of cast iron in building construction and it is confidently believed that a steel segment can be designed economically to replace the cast iron. This confidence is based on the fact that steel is a material of universal application in building construction, that it possesses strength and stiffness and has been employed in lining mine shafts in place of cast iron tubing and, therefore, has been used in vertical tunnel construction, if not in horizontal. Such a design is shown in Fig. 14 and its basis is worth some attention. The tunnel lining is subject to stresses in three general directions —transversely as a tube to resist the weight of superincumbent material under hydrostatic head, longitudinally as a beam under bending moments due to inequalities in the excavation, etc., and longitudinally also as a column to resist compressive stresses due to the back pressure of the rams.

Considered as a thin walled tube subject to a uniformly distributed internal pressure which would tend to split it longitudinally, such as would be produced by a weight of superincumbent material under hydrostatic pressure, the thickness of lining required for a tunnel 20 ft. in diameter under 100 ft. hydrostatic head would be, on the usual assumptions as to ultimate tensile strength with a factor of safety of 4, 1.056 in. for cast iron, .44 in. for wrought iron and .33 in. for medium steel; with a factor of safety of 8, 2.112 in. for cast iron, .88 in. for wrought iron and .66 in. for medium steel.

The longitudinal stresses due to inequalities in settlement are in the nature of the case indeterminate, but are beyond question small in comparison with those due to the hydrostatic pressure applied transversely. They are resisted by the bolts connecting the tunnel rings, and it appears reasonable that if the number of bolts fixed by experience in the cast iron lining is ample, it will not be necessary to use more in the steel. Moreover in the steel the stiffeners extend clear across the segment and lend to the ring their tensile strength and stiffness, while in the cast iron lining the ribs are not continuous and there is no strengthening or stiffening of the central portion of the segment.

The buckling of the sections under ram pressure may be prevented either by thickness of metal in the webs of the sections or by the use of stiffeners, it being understood that the packing plates which are placed under the rams will be of sufficient area to produce a uniform distribution of pressure over the web or stiffener. With the web secured against buckling the resistance up to the elastic limit would be equal to the fibre stress multiplied by the web area. The ultimate shear value of medium steel may be taken at 48,000 lbs. per sq. in., elastic limit 50 per cent. to 60 per cent. of the ultimate. On the basis of 50 per cent. the resistance of a 24-in. channel would be 288,000 lbs. if ½-in. thick, 360,000 if ⅝-in., 432,000 if ¾-in. If stiffeners be omitted the safe resistance of the web at 24,000 lbs. against buckling will be 160,400 lbs. if ½ in. thick, 241,400 if ⅝ in., 322,200 if ¾ in. Inasmuch as the maximum forward pressure of one ram in the Pennsylvania Railroad tunnels was 275,000 lbs., it will be seen that if stiffeners are so arranged that one stiffener at least comes under each ram, ½ in. web thickness will be sufficient, and if no stiffeners are used, the steel need be but $\frac{11}{16}$ in. thick; and that, therefore, a 24-in. channel with a ⅝-in. web stiffened by heavy angles will be ample construction under ordinary conditions. The same conclusion is reached from the fact that the cast iron lining 1½ in. thick has proven satisfactory in a number of tunnels and it, on the same basis of calculation, is only good for 296,600 lbs. The elastic limit loads are used in this calculation as against the maximum ram pressure; the working pressures and the unit stresses, therefore, are much less. The use of stiffeners also strengthens the steel segment in the center, where the cast iron is weak.

Watertightness.—Outside the mechanical fit of the cast iron segments watertightness is effected by methods of grout-

ing and calking. A certain proportion of the segments are tapped with 1½-in. holes closed with screw plugs. Through these grout is forced under pressure to fill the space between the lining and the excavation. Care has to be taken in grouting to prevent contact with the tunnel shield, as the filling of the space between the lining and the shield will cause the latter to freeze fast or else impede its movements; grout behind the tail of the shield may also impede progress by increasing the friction. In the East river tunnel, Pennsylvania Railroad, a modified quick setting natural cement manufactured expressly for this work gave the best satisfaction. Grouting behind the lining is necessary only in firm material or rock; in silt or fine sand the small cracks are soon filled with the silt or sand and further passage of water prevented. The clay blanket has the same effect when in contact with the lining.

Most cast iron tunnel linings are made with a calking space usually machined on their outer faces. Where two rings or segments bolt together these spaces form a continuous groove, which are filled with calking material driven home with a tool. The rust joint mixture of iron filling and sal-ammoniac, in the proportions of 400 to 1 by weight, is in common use for this purpose. The plan approved for the first Hudson river tunnel called for the placing of strips of creosoted wood between the longitudinal flanges of the segments. In the East river tunnels of the Interborough Rapid Transit, 16 ft. 8½ in. in diameter with 22-in. cast iron lining rings, the joints were calked by driving a lead strip tightly into the bottom of the groove and filling up the rest with rust joint mixture. Lead wire calked cold was also used in the East river tunnels of the Pennsylvania Railroad.

Tunnels are built with and without concrete lining. In the case of the Pennsylvania tunnels the cast iron segments were lined with concrete to insure permanency, to strengthen them further against outside pressure and to guard against accidents. This concrete was placed with side benches to keep the strains in the center of the tunnel in case of accidents, and to furnish sidewalks for the workmen employed in track and tunnel maintenance.

Watertightness may be effected by two methods; first by a machine shop fit of the segments calked with approved joint mixtures assisted by exterior grouting, as is the common practice, or second, the segments may be fabricated in accordance with bridge shop practice, so as to reduce their cost, and lined with concrete waterproofed by customary methods, assistance being given also by external grouting. Both of these methods are allowed for in the design of the steel tunnel lining. Whatever method of watertightness is followed, the tunnel segments should be rotated in erection so as to break joints and to prevent the intersection of four joint lines at one point and the bolts connecting the joints should be all drawn up tightly, as the tightness of the joints affects the watertightness of the whole structure.

The advantages of steel for tunnel lining as compared with cast iron are obvious. Sections of the same size and strength are much lighter and, therefore, more economical in transportation, handling and erection. Sections of the same weight would be longer and rings can be assembled with fewer pieces. Rolling processes being much more perfect than casting, machine work may be dispensed with and the segments made by ordinary fabricating methods. The toughness of the steel obviates breaking of segments due to uneven movements of the shield and the expense of their removal and replacement. The use of steel permits also the use of field rivets and in consequence the making of more nearly waterproof joints without calking. Thirty feet of steel lining has been experimentally installed in an 8-ft. 8½-in. tunnel of the Hudson & Manhattan. It is confidently expected that the advantage seen in erection will be further amplified by service.

Pile Foundations.—The Pennsylvania Railroad plans contemplated the use of screw piles placed through special bore segments to sustain the tubes at points of low stability and to prevent the tendency of the tube to rise by reason of its buoyancy. Only one, however, seems to have been driven as an experiment, as experience showed they were not necessary. Foundation bents were, however, placed through the lining in the reconstruction of the East river tunnel of the Interborough Rapid Transit through the fine sand region some 1,200 ft. long. These foundation bents spaced about 50 ft. apart longitudinally consist each of two concrete filled tubular steel piles 20 in. in diameter, ½-in. thick and spaced 7 ft. 0 in. centers transversely. These piles were sunk to hardpan or rock by jetting through a 4-in. pipe embedded in the center of the pile, were filled with concrete while being sunk and afterwards were capped with a concrete cradle formed around the bottom of the tunnel shell. The bents have been sunk to depths varying from 10 to 50 ft., the jet being assisted where necessary by hydraulic jacks butting against the roof by means of distributing timbers. The whole construction is one of the most permanent character and another proof of the wide extent of subaqueous tunnel construction.

Tunnel construction is not child's play. In its modern extent it demands engineering and executive ability of no mean order. Accurate knowledge of geological conditions and civil engineering skill must be combined with large mechanical experience and mastery of transportation methods to produce the most economical and permanent results; above all is there a place for rational use of the modern materials of construction.

The material for this paper has been drawn largely from the issues of the technical press for the last five years, chiefly the *Engineering News*, the *Engineering Record* and the *Engineering and Mining Journal*. Reference has also been had to D. McN. Stauffer's Modern Tunnel Practice and to the description of the Pennsylvania Railroad's New York tunnels in the September, October and November, 1909, issues of the *Proceedings* of the American Society of Civil Engineers. The author claims no originality for the material; it has been his purpose to sort, classify and digest for the use and guidance of any master tunnel builder who may come after him. Perhaps it may assist some such builder in the construction of subaqueous tunnels under the Allegheny and Monongahela rivers as a part of the rapid transit system of future greater Pittsburgh.

THE TRAINMASTER'S FUNCTIONS.

III.

STATIONS.

A most important thing to watch is the condition of offices, waiting rooms and warehouses. When these are kept in a neat, cleanly manner everything else is likely to be done properly. See that all placards are removed when soiled. Nevertheless, observation should be made frequently as to the quality of the work. It is often found that an agent gets behind in his work for lack of system, letting his work pile up instead of doing it correctly as it comes along. Show him how time can be saved.

Careful watch should be kept over operators to see that they make proper use of all signals and safety devices. See that they comply with all rules relative to handling of train orders. Night men should be watched to see that they properly and safely care for baggage and mail and not leave them out. Unless absolutely necessary, never make use of a Pullman berth on your own division, nor make a practice of riding altogether in them, but spend a part of your time on different parts of the train.

Note anything that is wrong around the station, window-glass out, door fastenings gone, holes in platform, condition of freight room, office and waiting rooms, and insist upon

cleanliness and things being kept in proper order. See that agent or operator is supplied with proper signals, wears his uniform when time to sell tickets or meet passenger train; that trash is not allowed to accumulate back of the depot or out buildings. Keep sharp lookout for foreign cars. If loaded, get after agent to have them released, and at any time when cars are scarce, see that any loaded cars are released promptly. Look after baggage trucks and keep them repaired. Note whether or not switch lights and train order signals are kept clean and burning brightly.

Study very carefully the movement of loads and empties, consulting frequently with your chief despatcher and superior, figuring your train handling accordingly, so that your cost of operation will be upon your mind, as well as the rapid handling of your loads and the prompt placing of your empties for prospective business. The loading on your territory should be studied thoroughly season after season, especially at your larger freight stations, for in doing so and consulting with your various agents you may be able to effect great improvement, diminishing the number of cars loaded, time for handling and, in general, better this important branch of service.

YARDS.

Give special attention to delays caused by hot boxes; drop around in the terminal yards to see what attention they are getting from the "car knockers." I have caught them going down one side of a train and back up the other, not even opening a journal box unless there were some outward indication of heating. When taken to task and the waste was pushed up to journals very few hot boxes would develop for the next 150 miles.

Yardmasters should be schooled to figure out the yard operation, as far as possible, a day in advance, keeping in touch with the chief despatchers and connecting lines as to the outlook for business the following twenty-four hours, which can in most cases be closely estimated. Yard engines and crews are then ordered for the following day in accordance with this estimate. In this manner great saving can, in some cases, be effected in yard engines and like expense, and at the same time it has a tendency to enlarge the views of the yardmaster and make him capable of rendering more efficient service. Particular attention should be devoted to trains departing promptly at the time set for departure. Each case of failure should be investigated thoroughly and promptly, defects remedied and both train and yard men kept thoroughly alive to this important feature. This matter, as a rule, has considerable bearing on the success of the trip. The despatcher having taken the train at a time when it can best be handled, and its failure to depart at the time set, usually results in further delays at meeting points.

Employ good yardmasters. A train started on time is an inspiration, while one started late is a discouragement. Don't let the call boy be train and yardmaster; he will have all he can do if he gets crews out on time. Make up trains in station order at starting point instead of expecting the next yard to do it. The yard was built for the proper making up of trains, and a train can often be made up properly, if a little care is used, with as little work as otherwise.

Do not make local freights out of the majority of your trains simply to convenience a yard and save them a little work. Such trains will cause an unnecessary delay and you will lose in maximum train haul.

Perfect a strong organization at terminals under your jurisdiction so as to have a good check on the motive power and employees. Where there are several industries requiring more than one engine, the work should be properly distributed to each engine and then watched to see that each engine performs a good day's work, with no overtime.

PASSENGER TRAINS.

Sitting quietly in a modest compartment you will frequently hear travelers telling of the various ways they have of beating a conductor. Put your men on to their methods.

Know that both conductor and flagman are posted on all connections at each end of their run and at junctions; show them the importance of always being polite and attentive to the wants of passengers, and especially women with children. Impress upon the train porter the importance of keeping the coaches clean and of giving special attention to ventilation.

See that road crews furnish in detail reports of all detentions of ten minutes, or more, from time called until engine arrives on pit at end of run.

The writer always felt that a passenger trainman should not chew tobacco, so in employing young men who graded into the passenger train service he decided not to employ any young men who chewed tobacco. He smoked moderately, but not in the office or on the road, and to be consistent with his decision he gave up smoking altogether. After following this method for nine years he left that arm of the service, but during that time he had employed several hundred young men, who gave him their word that they did not chew tobacco and would not chew it. That was not sentimentality nor fanaticism; it was simply an element of common decency applied to a public service.

Passenger and special train service of any character should receive personal attention, as generally such service is watched by your management, and you will be called upon to explain all irregularities. Arrange to ride special trains and regular trains, both freight and passenger, that do not maintain schedule time, to see that the best possible service is rendered.

FREIGHT TRAINS.

Early in my career I was called out of bed one night by the jingle of the 'phone and told by the despatcher "223 is crowding 271," and asked: "Shall I let them pass?" Two-seventy-one was the through merchandise run and 223 a local passenger train. The division was new to me, but in this and similar cases I always decided one way or the other and said "yes" or "no." Sometimes my judgment brought a protest from my superior officers. But that was easy as compared with the nights that the despatcher would say: "Water over the track and washed out between A and B. Shall we detour the mail?" or "it's snowing hard and 790 is doubling into X; engine about out of water (or coal) and stock on the cars about the limit required by law." Then arose the question: "Haven't you a 'dead freighter' that you can put in at V. or W. and use its engine to double head?" Regardless of what went wrong, unless in case of accident, causing loss of life or serious injury, I make it a point to handle the case without disturbing the superintendent during the night. Sometimes when I had decided injudiciously he was kind enough to point out wherein I had failed. At other times the results were satisfactory, and he would say: "Jack, you did good work last night in handling so-and-so." If I discussed any problem with him I made my arguments according to my judgment, but after he had decided on a plan I worked to that end, regardless of my own judgment or opinion.

In keeping an organization in harmony for moving a business on a division nothing has better effect than first-class local freight service. If local business moves properly the through business will in turn move with more ease. For that reason particular attention should be given to way freight trains. The best conductors, flagmen and brakemen should be on these trains. They will not only keep down expense in overtime, but will reduce claims from improper handling. They will also place the road in better light to patrons along the line who have to deal with this class of employees. The men best adapted to handling this business should, in all cases, be placed on way freight trains, regardless of the rank in service. Nothing takes more petty worry off the trainmaster than first-class local freight service.

One of the greatest helps that a trainmaster can have is good and comfortable caboose cars. These cars should be so constructed that men can board themselves and sleep in their

cars, when away from home, and a safe storage track should be provided.

Each crew should have a regular car, and its good condition will do much to keep men in good spirits, and at work regularly, as they will not want to turn their car over to extra men. The best man in any position is the one who has respect for his comforts and health, and a comfortable employee is one who will care for his position and take a personal interest in his work. Such employee will be less susceptible to bad influences, which, in a trainman's life, are numerous.

Run local freights on time and clean up the road each day. A car left over to-day may be buried to-morrow and take twice as much time to handle; besides, it has been delayed.

Do not overload trains; the last 50 tons of any overloaded train will cost you as much as the handling of the balance of train.

Well and congenially organized crews will always give best results, and a crew once well organized should not be disturbed more than is absolutely necessary.

Men should not be allowed to lay off periodically, and those who have this inclination are not the best men, as they show that they are not interested in their work. The best men are always those who are interested.

When necessary, for filling a vacancy in a crew temporarily, an extra man should be used instead of allowing regular men to be chain-ganged. The successful operation of a train depends as much upon the proper and permanent organization of its crew, as the operation of a railway depends upon its official organization.

The following, printed on a mimeograph and distributed among yardmasters and trainmen, is a useful and convenient way of making and maintaining an assignment:

"The following shows assignment of conductors, flagmen and brakemen, caboose cars, as well as seniority of men, for ..... division.

"When necessary to fill vacancies the oldest man, in age of service, should be used, if such vacancy is permanent; if only temporary, the extra man standing first out should be used.

"Caboose cars must be kept with the crew to which assigned, and when cars are disabled, making a change necessary, an extra car must be used.

"Conductors and brakemen should not lay off except in cases of absolute necessity, but when it is necessary to do so they must make proper arrangements in sufficient time to allow the proper filling of their places."

ASSIGNMENT OF MEN.

Passenger Service.

Conductor.	Age.	Flagman.	Age.	Baggagemaster.	Age.
Adams, J. W.....	1	Arnold, C. W.....	2	Smith, A. H.....	3
Jones, E. H.....	2	Jacobs, M. H....	4	Sellman, C. H....	2
Sampson, G. W...	3	Jackson, C. N....	1	Johnson, E. M...	4
Jessup, H. N....	4	Simpson, T. H...	3	Joseph, F. G.....	1

Extra Passenger.

Moorehead, G. H.	5	Dixon, G. C.....	5	Jacobs, C. H.....	5
Williams, F. T...	6	Wilson, R. T....	6	Wintergreen, J.W	6

Freight Service.

Caboose.	Conductor.	Age.	Flagmen.	Age.	Brakemen.	Age.	Assigned to
2002	Messer, C. L..	1	Jones, G..	3	Wolf, R. M....	2	No. 51 & 52.
2001	Marsh, C. B.	2	Jack, T.G..	1	Wenn, T. J....	1	No. 51 & 52.
2004	Max. G. H...	3	Coe, T. L..	2	Carr, J. C.....	3	No. 53 & 54.
2003	Moss, G. T..	4	Bull, Y. G.	6	John, C. D....	7	Chain gang.
2006	Moore, R. E..	5	Nort, R.W.	4	Maxey, J. R..	6	Chain gang.
2007	Mann, R. W..	6	Wash, Y.U.	5	Moonney, D.H.	4	Chain gang.

Extra Freight.

Caboose.	Conductor.	Age.	Brakemen.	Age.	Brakemen.	Age.	Brakemen.	Age.
2005	Dow, T. H.	7	Dix, D. R..	7	Dan, T. H..	8	Mart, T. H.	9
2008	Ward, G. H.	8	Masy, G...	10	Worth, W.R.	11	Jones, T...	12
2009	John, G....	9						

Issued July 10, 1909.

.....Trainmaster.

Overtime and the regulating of constructive mileage has ever been an important factor in railway economy. A practical trainmaster should be able to indicate the cause of overtime more intelligently than anyone else connected with the company, for he is out on the road most of the time and knows just what a crew is capable of doing, the cause of unnecessary delays and is in the best position to apply a remedy.

A trainmaster is bound to attract attention if he watches closely constructive mileage. There are many roads that pay out large amounts of money every month in wages, for which they receive absolutely no returns. If the trainmaster is on to his job he can reduce the cost of handling trains considerably.

MISCELLANEOUS SUGGESTIONS.

The hardest, best, most valuable training was on small roads, because the small roads are lacking in resources and they develop individual initiative. They are also more closely supervised; the worthless man is quickly eliminated and the good man is soon recognized and appreciated. An experience on local freight on a small road gives a man an excellent training. If we got off the track we got on again; if flues leaked we hunted mills for sawdust or bran or confiscated rice from a local car and pumped it into the boiler; we tackled anything and everything; made double flying switches, coupled without stopping and passed thirty and forty car trains on ten-car sidings. If a confirmed loafer was assigned to a crew he was left at some way station. No laggard or loafer could live with those intrepid, daring, energetic fellows; the atmosphere was too highly surcharged for his comfort. But every man had a fair deal, and if one was really ill or crippled he was treated with consideration.

But what a difference from this on the great systems. It was as if a sailing master had been transferred from a sailing ship to a liner, for on the big divisions the traffic, in the main, is from one terminal to another, and the crews simply ride along. To make up a train in a yard was a task; to run a local freight over a road was a feat to most of the men. Energy and initiative were lacking; laggards and incompetents cursed the life of the yardmasters and stifled the energies of capable men. There was little to quicken endeavor, less to stimulate individual initiative, and the prevailing spirit was carping, hypocritical and arrogant. These conditions were due, first, to a lack of deliberate, painstaking care in the selection of men, and second, because there was no method of eliminating incapable employees; consequently, the dull, apathetic, ordinary creature, devoid of concern for the company's welfare, suffered nothing for these deficiencies. As long as he did not wreck a train or commit a heinous crime he could keep step with his fellow-employee, who possessed and exercised all the qualities the former lacked.

Mr. A. is trainmaster of the first division and Mr. M. is trainmaster of the second division on the same system. Mr. M. does not allow his trainmen to unfavorably criticize the despatching. His men make reports of their delays, but do not assume to say that the despatcher could have done better had he known more. It has been kindly but firmly explained to them that they are not competent judges of this particular matter.

Not long ago a trackage arrangement was made by virtue of which thirty or forty first division crews run over the second division track for about fifty miles. This arrangement was not more than well started, when Mr. M's office began to be flooded with reports (many of them under "personal" cover) from conductors and enginemen of the first division—all on the same subject and all to the same effect, viz.: that the despatching could not be worse done if it were undone.

After causing it to be thoroughly understood that second division etiquette would be standard in second division territory, Mr. M., by means of a little quiet investigation, discovered that most unfriendly relations existed between Mr. A. and Mr. J., who is chief despatcher of the first division. All the trainmen and enginemen were well aware of this feeling and sought to gain favor with Mr. A. by furnishing him ammunition with which to fight Mr. J. At first glance this might seem like loyalty of his men to Mr. A., but having been allowed to treat one kind of authority with disrespect they have acquired a very general contempt for any and all authority, and Mr. A. has a division full of insubordination as his reward for not "playing the game."

RAILWAY DEPRECIATION ACCOUNTS.*

BY C. I. STURGIS,
General Auditor, Chicago, Burlington & Quincy.

I shall not confine myself to the consideration of depreciation accounts in the abstract, but shall consider them in relation to the very live question of railway regulation. By so doing my efforts will, I trust, prove more interesting.

What is depreciation? It is not very well understood and but little has been previously written on the subject, so I shall take the liberty of attempting a definition.

Broadly speaking, depreciation is a lessening in value. To illustrate: A manufacturer buys a lathe and puts it into use; later he sells it. The difference between the value new and the value worn out represents the depreciation. This depreciation is measured by what the manufacturer has to pay for a new lathe, which he must buy to take the place of the old one, but, from the price paid for the new lathe there must be deducted the amount realized from the sale of the old one, and what is left measures the depreciation. When we talk about setting aside a depreciation fund, we mean setting aside, out of income, periodically during the life of the lathe, various sums which, in the aggregate, should equal the amount of depreciation by the time a new lathe must be purchased.

This depreciation, or lessening in value, may be due to two causes, which we may classify:

(1) Depreciation due to wear.

(2) Depreciation due to premature abandonment, necessitated by changed conditions; this is generally known as obsolescence.

The first of these, that is, depreciation from wear, is the simpler, and in its determination by month or by year, in advance, we can apply certain general principles for all properties of any given class, but beyond these generalizations are thousands of questions of detail, so complex as to require separate study for each independent plant or railway, and when all is said and done the result is but an estimate. On a railway, the life of ties varies with soil and climate, the life of bridges depends on the weight of locomotives running over them, the life of locomotives depends on the quality of water and coal with which they are fed, and there is hardly a railway tool or machine, the life of which does not depend on local conditions, and, even if, in determining depreciation, we could approximately estimate such variable factors as those, we would still have to consider what in the end will be the cost of the new articles to replace the old, and with markets ever fluctuating that is impossible definitely to determine. Furthermore, prosperous roads, in maintaining high standards, consider equipment is worn out when, on poorer roads, it would be considered still good for many years of service.

Beale and Wyman, in their work on "Railroad Rate Regulation" (Section 430), say:

> "In general, an annual charge for depreciation in value of the plant by use, seems proper. This is again a matter which cannot be decided by general rules as to a standard percentage, but is a matter of careful investigation into the character of the particular plant."

The second class, that is, depreciation due to this obsolescence, is far more difficult to anticipate and to measure and commissioners may well shrink from assuming a railway director's responsibility along this side of the financial policy of his road.

No doubt some of you are manufacturers, or are interested in manufacturing plants, and know how often newer makes of machines, in the hands of your competitors, force you to dispose of yours, when only partly worn out, that you may meet the competition. To take care of this depreciation, the successful manufacturer must put aside sums equal to 10 or even 20 per cent. of the value of his plant, in those years when he can afford to, that is, when satisfactory prices and large business warrant his doing so. Good business policy dictates that the railway director should do likewise, for a similar condition holds in the manufacturing side of railroading, that is, the building of locomotives and cars. With up-to-date machinery, the railway can afford to do its own building, because the maintenance of the plant, salaries of officers and general expenses, as well as the cost of running boilers and dynamos, are shared with the repairing and other branches of railway work. This advantage to the railway lasts only so long as its planers, lathes and other machines are as up-to-date as those of the outside builder.

As further illustration of depreciation due to premature abandonment, necessitated by changed conditions, let me cite one or two further cases: A railway has 40 miles of road in a city, and the city authorities require that the tracks be elevated. The old roadbed must be abandoned, a new and more expensive one built, and this without bringing one cent more earnings. This is clearly a case of depreciation due to premature abandonment of the old roadbed. Some will claim that while track elevation brings no more gross earnings, it does result in larger net earnings, because it saves payments for gates and gatemen and for personal injuries. Without disputing the propriety of track elevation, under certain conditions I contend that the expense of those gates and gatemen and the personal injury payments became necessary after the road was originally built, and their growth represented loss of efficiency and hence increased expense, and therefore were in the nature of depreciation charges.

On another road the director sees that a city, to free itself from smoke, is likely to insist on electrification of the railways or perhaps he sees the approaching necessity of steel freight and passenger cars. Either of these requirements means premature abandonment of a still good conditioned plant and equipment and the rapid accrual of depreciation due to prospective and sudden ending of efficiency. These changes will bring no increase of earnings and the expenditure may come in a year when his earnings are not large, therefore the director should begin at once to set aside each year, out of income, as much as he can spare, in order to meet these expenses.

Permit me to give one more illustration in the way of a definition of this depreciation due to obsolescence: C. C. McCain, in his pamphlet on "The Diminished Purchasing Power of Railway Earnings," recites that the price of coal per ton of 2,000 lbs. at the mines, as given by the United States Geological Survey, was, in my state, Illinois, 72 cents in 1897 and $1.07 in 1907, an increase of 48.61 per cent. It is interesting to study the effect of this increase, in the price of fuel, on the necessity of premature renewals and, consequently, on depreciation. This increase necessitated greater earnings per train, which meant heavier engines to pull more cars, larger cars to reduce dead weight as compared with paying loads. Then the heavier engines required heavier rails and roadbed and stronger bridges, and all without any increase in net earning efficiency.

In England there has been consideration of this question of depreciation in its relation to railways. It was there a question involved in the determination of the income tax, and the railways and the taxing authorities agreed upon the amount of depreciation which should be included in the statements made up for the purpose of determining the taxable income. I understand that this agreement applies only to the tax returns, is mutual and amicable, and is to avoid a wrangle each year with each company over the amount to be deducted, from gross income, for depreciation, in determining the net income on which the tax is to be assessed. This agreeing is parallel to the practice in this country of lawyers agreeing on certain elements in a case and so avoiding the necessity of arguing them out before the court.

At this point I want to impress upon your attention the fact

*An address before the National Association of Railway Commissioners, Washington, D. C.

that the English agreement covered only depreciation deducted in the determination of the taxable income, and that while a similar agreement (or an arbitrary or a court ruling) may be necessary in this country, in determination of the net income to which the recently passed Corporation Tax Law shall apply, such depreciation figure will not properly be the one which the directors of any railway will wish shown on the books of their company. In other words, the necessity under the law of determining the net income seems to force upon the Department of Internal Revenue the necessity of deciding how much it is willing to allow the railways to deduct for depreciation; even as the Interstate Commerce Commission must decide, in any hearing on rates (where net earnings are to be considered), how much the railway at bar may deduct for depreciation.

In our country the diversity of practice on different roads resulted in an attempt by the authorities charged with the formation of a uniform system of accounts to arrive at a basis for determining amounts which, charged monthly on the books of different roads, would distribute, by months, the depreciation claimed by some to be uniformly going on on railway property. There has been much controversy in an attempt to determine whether there is any depreciation which should be recognized in the accounts and, if any, how much. The present rules of the Interstate Commerce Commission permit of a depreciation charge and in any amount desired by each carrier, but it is understood that the commission contemplates determining upon an arbitrarily determined basis for the charge, to be as nearly correct as may be, and requiring all the roads to use that basis.

This intention to require the roads to make upon their books a monthly charge for depreciation is, it is claimed, justified by the 20th Section of the amended Interstate Commerce Law. I quote the following from that section of the law:

"Sec. 20. (Amended June 29, 1906.) * * * ; and the Commission may, in its discretion, for the purpose of enabling it the better to carry out the purposes of this Act, prescribe a period of time within which all common carriers subject to the provisions of this Act shall have, as near as may be a uniform system of accounts, and the manner in which such accounts shall be kept.

"Said detailed reports shall contain all the required statistics for the period of twelve months ending on the thirtieth day of June in each year, and shall be made out under oath and filed with the Commission, at its office in Washington, on or before the thirtieth day of September then next following, unless additional time be granted in any case by the Commission. * * *

"The Commission may, in its discretion, prescribe the forms of any and all accounts, records and memoranda to be kept by carriers subject to the provisions of this Act, including the accounts, records and memoranda of the movement of traffic as well as the receipts and expenditures of moneys. The Commission shall at all times have access to all accounts, records and memoranda kept by carriers subject to this Act, and it shall be unlawful for such carriers to keep any other accounts, records or memoranda than those prescribed or approved by the Commission, and it may employ special agents or examiners, who shall have authority under the order of the Commission to inspect and examine any and all accounts, records and memoranda kept by such carriers. This provision shall apply to receivers of carriers and operating trustees. * * * Any person who shall wilfully make any false entry in the accounts of any book of accounts, or in any record or memoranda kept by a carrier * * * or who shall wilfully neglect or fail to make full, true and correct entries in such accounts, records or memoranda, of all facts and transactions appertaining to the carrier's business, * * * shall be deemed guilty of a misdemeanor * * *"

We should now consider what constitutes a "System of Accounts." The "Century" dictionary defines the word account as "a reckoning of money or business; a statement or record of financial or pecuniary transactions." That and other authorities show that accounts are records of transactions—of actual transactions of things actually done. What then is a System of Accounts? It is a plan—a comprehensive plan—of recording actual transactions. Now, therefore, when the law authorized the Interstate Commerce Commission to formulate a System of Accounts did it not authorize it to go ahead and draw up a plan of recording actual facts and transactions? That seems to be what the law authorized and in no manner can the 20th section of the law be stretched to, or interpreted as, regulating the actual transactions which the accounts record. Everything in this section 20 seems to imply that the reports required shall deal with facts. It says, "a complete exhibit of the financial operations of the carrier each year," and, again, "shall be made out under oath." All through the section there is reference to the recording of facts and transactions and there is not one word about prescribing what those facts and transactions shall be.

This section of the law does not appear to authorize the commisson to arbitrarily determine what amounts, if any, any railway shall set aside to cover depreciation. The act of setting aside an amount is a transaction wholly within the right and power of the directors of the railway company and the commission can properly order the recording of such act upon the books and state how and in what manner it shall be recorded, how it shall be shown in the accounts and statements, but it cannot arbitrarily determine the transaction itself.

I understand that neither in this section 20 nor elsewhere in the law is the commission given the power to regulate this class of transaction. This fact seems to have been determined by the oft-quoted opinion of Mr. Justice Brewer, in the case of the Interstate Commerce Commission versus Chicago Great Western Ry., on Appeal to the U. S. Supreme Court 209 U. S. 108. The learned Justice said:

"It must be remembered that railways are the private property of their owners; that while, from the public character of the work in which they are engaged, the public has the power to prescribe rules for securing faithful and efficient service and equality between shippers and communities, yet in no proper sense is the public a general manager. As said in Int. Com. Com. vs. Ala. Mid. R.R. Co., 168 U. S. 144, 172, quoting from the opinion of Circuit Judge Jackson, afterwards Mr. Justice Jackson of this court, in Int. Com. Com. vs. B. & O. R.R. Co., 43 Fed. Rep., 37, 50:

"'Subject to the two leading prohibitions that their charges shall not be unjust or unreasonable, and that they shall not unjustly discriminate so as to give undue preference or disadvantage to persons or traffic similarly circumstanced, the act to regulate commerce leaves common carriers, as they were at the common law, free to make special rates looking to the increase of their business to classify their traffic, to adjust and apportion their rates so as to meet the necessities of commerce and of their own situation and relation to it, and generally to manage their important interest upon the same principles which are regarded as sound and adopted in other trades and pursuits.'"

The proper interpretation of section 20, taken in connection with Mr. Justice Brewer's opinion, has special bearing on the commission's intention, several times announced by Mr. Henry C. Adams, of exercising supervisory control over railway operations through the agency of accounts.

The intention of Congress, in giving to the commission the right of control over the accounts, must be interpreted as a desire to enable the commission to carry out the other provisions of the law, about which Mr. Justice Brewer has said, "in no proper sense is the public a general manager" and common carriers are "free * * * to manage their important interests upon the same principles which are regarded as sound and adopted in other trades and pursuits." It is a fact that, incidentally, section 20 does control management, but only in the indirect way in which all publicity of accounts tends to prevent questionable and dishonest acts of management.

To sum up, there does not appear to be anything in this 20th section which authorizes the requirement that the accounts be made to contain anything but a record of transactions, nor does this section 20 authorize excluding from the accounts the record of any transaction which has been had. If this is so, then it would seem that an arbitrary depreciation charge cannot be ordered by the commission to be placed upon the books of a railway company until such time as the commission has right to order the transaction itself, that is, the right to order the directors of a railway to set aside such amount from the annual income as the commission may deem proper. I propose to show later why the commission should

not desire this right, which now belongs strictly to the board of directors of a railway, who alone are held responsible for the successful conduct of the property, including its financial policy, upon which, perhaps more than on anything else, depends the success or failure of every legitimate business enterprise. In the opinion above quoted it is implied that the directors of a common carrier are free to manage its financial policy "upon the same principles which are regarded as sound and adopted in other trades and pursuits."

In the *Railway Age Gazette* of October 2, 1908, page 1050, a writer well expressed this phase of the question. He wrote:

"It is suggested with a good deal of force that it is the duty of the board of directors of each railway company to determine from time to time, according to the fact as they exist, when and to what extent charges should be made against income on account of depreciation which has actually occurred, and also to determine the proper means of providing for meeting these charges, either out of the company's surplus or otherwise. Has the Act to Regulate Commerce taken from those boards of directors any of their authority in these respects, or relieved them of any of their responsibilities? In other words, has the commission a legal right to compel railways to make charges in order to create reserve accounts against liabilities which it is estimated will occur?"

There is another reason for questioning the commission's power, under authority to prescribe a uniform system of accounts, to order an arbitrary charge for depreciation or any charge at all. This depends on the necessary nature of such a charge. It is an estimate. No definite or satisfactory rule can or ever has been found for determining the exact amount of depreciation in any manufacturing institution and still less on a railway. There are so many factors which enter into such a determination, and each factor varies so greatly with each branch of industry, and with each department of each branch of industry, and with each variety of condition surrounding each such department, and with every busy day as against every dull day, and with each rainy, dry, hot and cold day; each separate condition having an unequal bearing on the amount of depreciation accruing.

At the last annual meeting of the American Association of Public Accountants, a paper on depreciation was read by Herbert G. Stockwell, C. P. A. I do not know Mr. Stockwell personally, but his paper shows careful study by an analytical and practical mind and one cannot read it without realizing that this question of depreciation is far-reaching and is not to be easily disposed of with an arbitrarily fixed per cent. for general application. Mr. Stockwell said:

"I think it can be confidently asserted that there are no two manufacturing plants in this country in which the management is sufficiently identical in character ability and temperament that a depreciation charge in the same amount, or on the same percentage basis, could be correctly used in both. This being true, how useless it is to attempt to form averages for the life of machines in all plants, even in the same lines of business.

"It seems to me that the only way that the annual amount of depreciaation can be determined is by a study of each individual plant, and the application of the figures representing the depreciation to that individual plant and no other. To say that it is absolutely impossible to figure depreciation in advance is true. This is a statement that comes under a general proposition that the actual value of no asset can be determined until it is converted into cash."

All of these difficulties make the problem one of great complexity—so much so that the theoretical advocate of a correct basis for depreciation seeks refuge in the claim that the law of averages must govern. This is really begging the question, for the bases for the averages exist only in men's minds and are not determinable facts. This shows that any annual depreciation charge can only be estimated—must be an estimate—and, according to the opinion of Judge Calhoun, in the so-called Texas Bookkeeping case, an estimate upon any theoretical or arbitrary basis cannot be required by a commission under a law which gives to such commission a right to prescribe a system of bookkeeping. The opinion referred to contained the following:

"Now, as I understand, under Article 4571 of the Revised Statutes of 1895, the Railway Commission of Texas has power to prescribe a system of bookkeeping to be observed by all the railways subject thereto, under penalties prescribed in the article. Now, there is no definition in that statute of what is meant by a 'system of bookkeeping.' Therefore, the common acceptation, as I understand it, or what is generally understood, of what is meant by a 'system of bookkeeping,' must be interpreted as the system meant by the law. Now, bookkeeping is the act of recording pecuniary transactions in a regular and systematic manner, or, in other words, the art of keeping accounts in such manner as to give a permanent record of business transactions, from which the true state of history of one's pecuniary affairs or dealings may at any time be ascertained.

"I further conclude that under the law it was never intended by said statutes to require the railways to arbitrarily divide their expenses upon any theoretical or arbitrary basis, and to enter the same as a part of their system of bookkeeping, and in my opinion, there is no power vested in the Railway Commission of Texas to require the same of them, The power which in my opinion is vested in the Railway Commission under said act is to require the railways of Texas that they keep their accounts by a uniform system of bookkeeping and to record all facts as facts in such manner that the true state or history of their pecuniary affairs or dealings may at any time be ascertained by the Railway Commission in any manner authorized or prescribed by law."

The idea of exercising supervisory control over railway operations, through the agency of accounts, did, I have been informed, originate in the Statistical Department of the commission, and it is not unnatural. Many of us railway auditors have had the same dream. It is natural for one who feels that his ambition in the railway world is limited to the formulating and the keeping of accounts. This auditor's dream of the control of operation through the accounts has invariably had a rude awakening when it bumped up against the practical question. With whom does operating responsibility lie? The railway director, looking far into the future and realizing his responsibility to the investing public which he represents, is continually confronted with new problems, to meet which ordinary prudence requires the setting aside of depreciation funds. Where these future problems take the shape of exceptionally large renewal charges, he should set aside out of the current year's income as much as can be spared to meet the future expenditures. If at this stage he finds that the government has limited the amount which he may set aside, as result of which the misinformed stockholder clamors for and gets further dividends, who is responsible for this failure to provide for the future expenditure? In that case, does the responsibility rest with the director or with the government? Gentlemen, I do not believe that any one of you is willing to relieve the director of that responsibility.

When the directors have decided that an amount shall be set aside to meet depreciation incident to future renewals, the commission may properly, under the twentieth section of the Interstate Commerce Law, insist on it being shown in the accounts and reports—that is publicity and is reasonable—and if there is a hearing before a commission or before a court the railway should be called on to explain its justification of the amount it has set aside, that the commission or the court may decide, on the evidence, whether the amount is too high or not high enough as affecting the question before it.

After all, what would be gained by requiring roads to make monthly charges to depreciation on a fixed standard percentage basis?

The railway manager would not be benefited because, in studying the monthly returns, he would have to discard this arbitrary figure before he could determine the actual results accomplished by his efforts to obtain business and by the exercise of his judgment in making renewals and in operating the property.

The investor would not be benefited, because including a charge for depreciation in the monthly accounts and published statements of a railway is but a "penny wise, pound foolish" attempt to show the investor, by a present 30-day measure, how valuable or otherwise his investment is. As a matter of fact, the true investor bases his idea of value on past history and future prospects, and the immediate present snap-shot

view given by a monthly statement misleads more than it helps him.

The public would not be benefited, for if railways are to be regulated it must be on the basis of facts and not of estimates. The use of an arbitrarily based depreciation figure for all roads or for a group of roads is similar to a doctor giving the same pills for all ailments.

It is sacrificing broad policy in railway financing to an attempt to get theoretical accounting.

The attempt to apportion depreciation, by months, may have been based on the common practice of including in the monthly accounts, on an estimate, certain regular monthly bills which are not received before the closing of the month's accounts, but this latter practice, like the monthly apportionment of bond interest, is the including of a part payment of an actual expense, and hence there is no parallel between that practice and the including of a monthly depreciation estimate. It has been contended that if an estimated depreciation rate is used, and at the end is found to be too high or too low, an adjustment can then be made. This is an admission that the arbitrary monthly figure may be and probably will be wrong and, furthermore, there is no cutting off place, there is no time in the future when we may say—now we may take the measure of the correctness of all these past monthly depreciation charges.

To gain the imaginary advantage of having arbitrarily fixed depreciation, the railway director would be deprived of the right to do that for which he is responsible to his stockholders and to the public, that is, to intelligently carry out that financial policy which will maintain the property for its owners and which will build up a successful and prosperous railway, able to give high standard service to the communities through which it runs and to give employment to thousands located along its line.

PENNSYLVANIA STATION AT BALTIMORE.

Contracts are about to be let for the new union station to be built at Baltimore, Md., by the Northern Central, a subsidiary of the Pennsylvania Railroad. A general description of the proposed station appeared in the *Railway Age Gazette* of November 12, 1909.

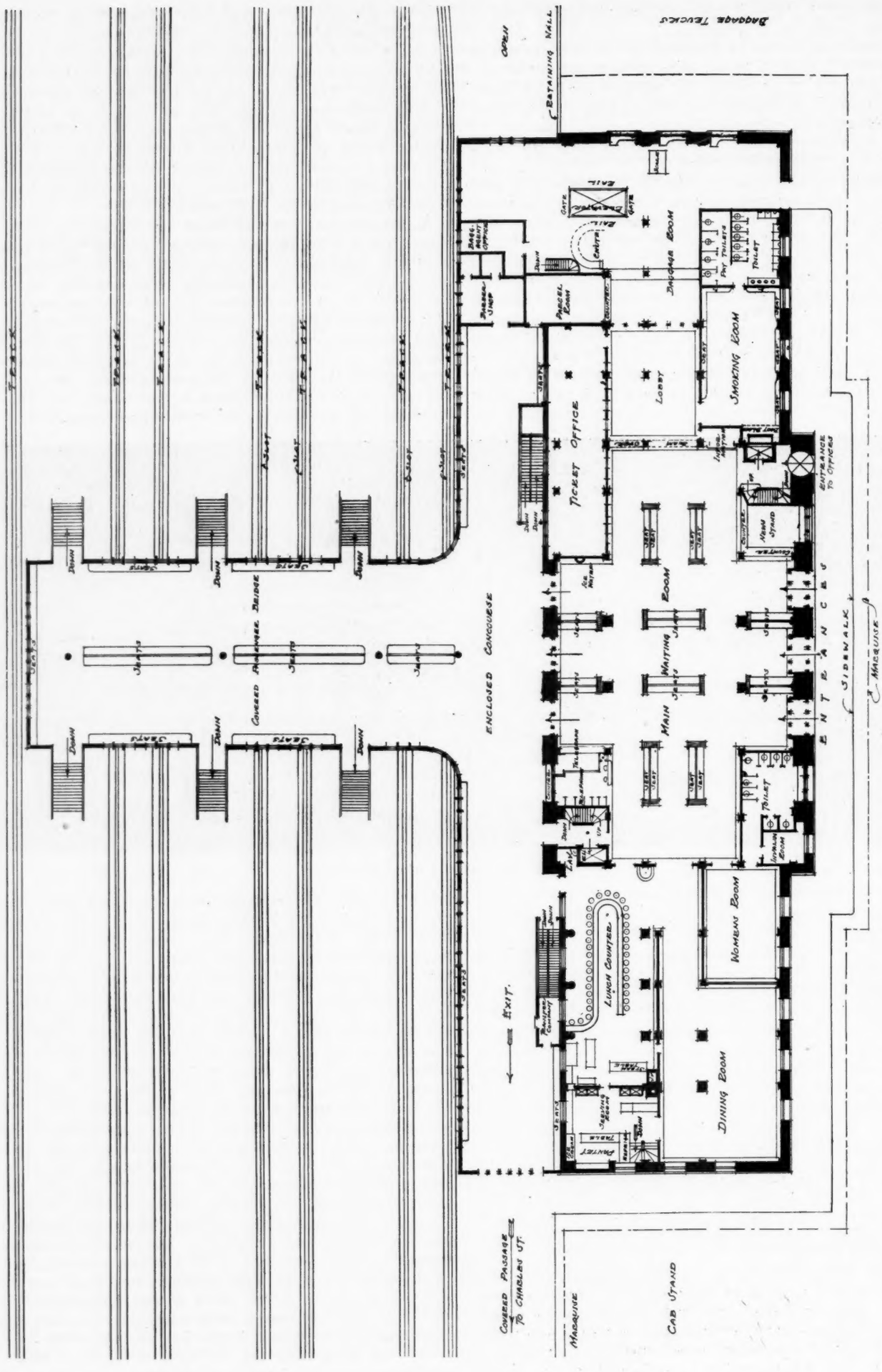
The new building will be on the site of the present union passenger station between St. Paul street and Charles street and just north of Jones falls. The present station covers about half the area which will be taken up by the new building. The station fronts south, toward the center of the city. The front of the building is on an angle with Charles street and an approach 110 ft. wide will be built from the center of the station to an intersection with Charles street. This approach will be on a bridge over several spur tracks and over Jones falls. It meets Charles street about 200 ft. from the station. The small triangle left between the station, Charles street and this approach will be parked, and it is proposed also to extend the parking south along the east side of Charles street so that there will be a large open space for several hundred feet in front of the station. This, however, is as yet undecided. There is a street car line on Charles street, but none on St. Paul street.

As the accompanying plan shows, the concourse is at street level. There is an enclosed concourse parallel to the tracks with a covered passage leading past the cab stand to Charles street. The rest of the concourse is on a bridge over the tracks. Incoming and outgoing passengers are not mechanically separated, but their movements should be unrestricted, since incoming passengers will diverge through the enclosed concourse toward Charles street, while outbound passengers will go from the main waiting room direct to the head of the stairs leading to the platform on which their train stands. At the top of each stairway there will be an illuminated train

Model of Baltimore Union Station.

indicator, and tickets must be shown at these points. There will be six station tracks for passenger trains; the two outer tracks shown on the plans are for freight service. The platforms will be 20 ft. wide. The tracks will be protected with Bush train sheds, several installations of which have been described in these columns. The sheds will extend from the St. Paul street viaduct to Charles street. This type of shed was decided on after a committee of five Pennsylvania Railroad officials had inspected all available types of train shed.

The baggage room at the street level is to be used only for luggage which the passenger brings to the station with him. The main baggage room is below on the track level. This level is reached by an inclined driveway opening on St. Paul street just south of the new street parallel to the tracks in front of the station. A baggage chute and an elevator also connect the baggage room on the street level with the large room at track level. In all, there will be five elevators in the building. There will be no subways under the tracks for handling baggage to the platforms; baggage will be trucked across the tracks. A feature of the baggage room will be the doors, which will be the Cross folding type. These are composite doors, made up of units hinged horizontally; the smaller doors can be opened independently or the whole compound door can be opened by folding up and lifting all the units. The other rooms on the track level of the building include express room, immigrants' waiting room, commissary



Plan of New Union Station of the Northern Central at Baltimore.

department rooms, trainmasters' office, station master's office.

The two upper floors of the building will be used for offices. The main waiting room is three stories high, being covered by a skylight. The building is fire-proof, steel and concrete construction. The exterior will be finished in pink Milford granite, and, as the accompanying model of the building shows, there will also be considerable ornamental iron work. The interior of the waiting room is of Doric architecture and will be finished in Pentellic marble, the same stone of which the Parthenon at Athens is made. The concourse on the bridge over the tracks is lined with Faience tiling, and all rooms in the basement are also tiled.

The station will cost $700,000 and it is expected to have it finished by July 1, 1911. It was designed by Kenneth M. Murchison, New York, his plans being selected from eight competitive plans submitted by architects in Chicago, New York, Philadelphia and Baltimore.

RAILWAY EARNINGS IN 1909.

The Interstate Commerce Commission has issued a statement showing the revenues and expenses of all railways in the United States for the fiscal years ended June 30, 1908 and 1909. This annual bulletin, compiled from the monthly reports, is in effect a substitute for the preliminary report on the income account of railways, heretofore compiled from the annual reports of carriers.

The returns submitted have been compiled, as in previous monthly bulletins, in such a manner as to show the operations of the important systems in which most of the railway mileage of the United States is included. There is also shown the grouping of the roads by classes, for which the new forms for annual report make provision. An additional table is provided, showing detailed figures for each road filing monthly reports. In commenting on the report Henry C. Adams says:

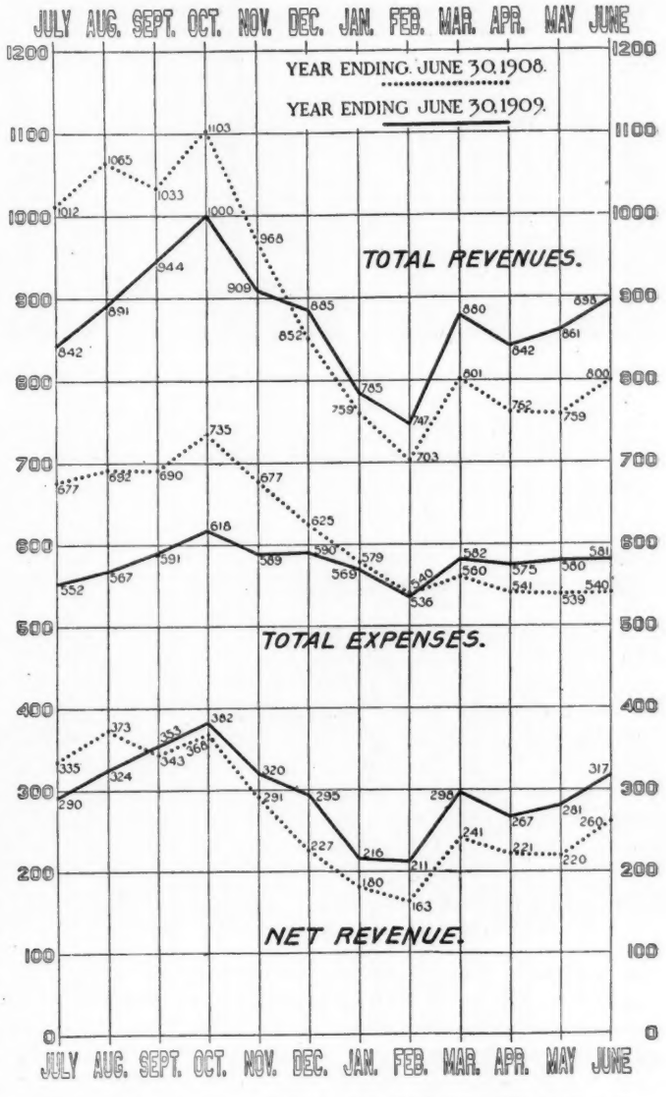
"If rail operations and outside operations be combined to produce a proper basis for comparison with the results of years prior to 1908, the general summary shows a constant increase in revenues, which, for the year ended June 30, 1909, exceeded those for the year ended June 30, 1908, by $32,594,244. At the same time, the rather general tendency to greater economy effected a decrease of $59,224,982 in the corresponding expenses, resulting in an increase of $91,819,226 in total net revenue.

"Reduced to per mile of line averages which, of course, take into account the increase in average mileage operated during the twelve months, approximating 5,000 miles, the figures show that the increases in gross earnings during the last half of the year ended June 30, 1909, were not quite sufficient to offset the decreases during the first half of the year, the respective amounts being $10,704 for 1909, as against $10,788 for 1908, $11,383 for 1907 and $10,460 for 1906. On the other hand, operating expenses per mile, which showed a constant upward tendency until the year ended June 30, 1907, with $7,687 per mile, were only $7,544 per mile for 1908 and $7,133 for 1909.

"The increase in net revenue per mile of line, the amounts being $3,189 for 1905, $3,548 for 1906, $3,696 for 1907, $3,244 for 1908 and $3,571 for 1909, shows that the year ended June 30, 1909, corresponds in its net results as closely to 1906 as 1908 did to 1905, and if the present upward movement continues, 1910 will compare with 1907, which latter year now represents the high-water mark in railway earnings.

"Notwithstanding the marked decline in the volume of railway traffic beginning with November, 1907, the average revenues and expenses per mile of line for the fiscal year 1908, although below the corresponding averages for the year 1907, are higher than for the year 1906. The average net revenue per mile of line for the fiscal year 1908 is below that of both the year 1907 and 1906, but it does not fall below the corresponding figure for the year 1905. Should taxes be included among the deductions, thus changing the comparison from total net revenue to operating income the result for 1908 is only $9 per mile of line below that for 1905.

"The first of the general conclusions to be drawn from the data submitted is that the assignments per mile of line and the ratio of operating expenses to operating revenues, as well as the ratios existing among the various sources of revenue, and among the several classes of expenses, which have been reported by this office in previous years for railways of all classes, are in the main correct as representing the operating results of the large roads. This means that while the operating results of small roads and of switching and terminal companies differ greatly from the corresponding results of large roads, the amount of mileage, revenues and expenses contributed to the total by these two classes is relatively so slight



	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
*	66.90	64.99	66.82	66.64	69.92	73.40	76.32	76.84	69.86	70.99	71.01	67.49
†	65.59	63.63	62.64	61.80	64.78	66.65	72.43	71.79	66.16	68.33	67.39	64.73

Revenues and Expenses by Months in 1908 and 1909.

* *Operating ratio in* 1908. † *Operating ratio in* 1909.

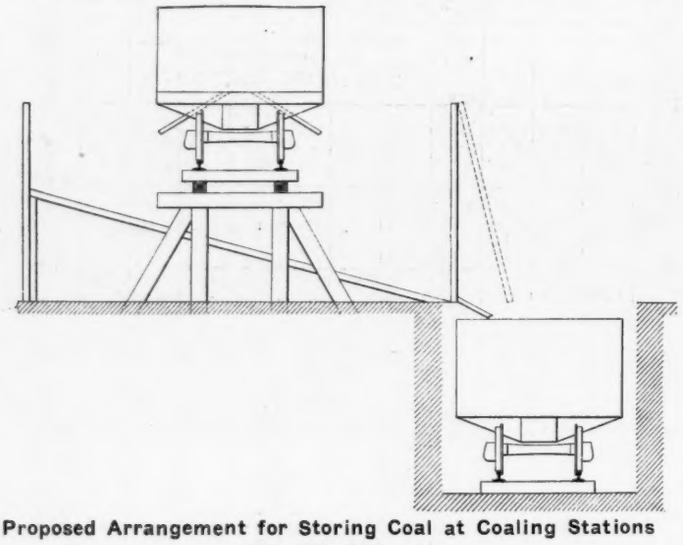
as compared with the total that the general results are not appreciably disturbed. Thus for 1909, the ratio of operating expenses to operating revenues for all carriers, according to the summaries, was 66.12 per cent.; for class A, that is to say, the large roads, the corresponding ratio was 65.98 per cent.; while for class B, the small roads, it was 72.31 per cent., and for class C, the switching and terminal companies, 66.49 per cent. It is a significant fact, and one that warrants the classification, that while the revenue from rail operations per mile of line of large roads is $11,010.78, that of small roads is $3,115.38, and of switching and terminal companies, $19,129.32."

The accompanying diagram shows graphically the revenues and expenses of all railways in the United States for the fiscal years 1908 and 1909.

COAL STORAGE BIN.

The Atchison, Topeka & Santa Fe has a number of coaling stations in which the coal is carried by a belt conveyor from a small bin at the ground level to a bin above the chutes. The combined capacity of both of these bins is small and it is necessary to dump most of the coal on the ground. When it is required it is loaded on a car by hand, the car is then run up a slightly elevated track and is dumped into the bin at the foot of the conveyor. This is a slow and expensive process, but it would be too expensive to install a system of conveyors such as is used in a large storage plant.

To cut out the manual handling of the coal and reduce the



Proposed Arrangement for Storing Coal at Coaling Stations of Small Capacity.

expense, James Kiely, master mechanic at Clovis, N. Mex., has proposed an arrangement, which is shown in the illustration. The coal is dumped from the car on a low trestle into a bin at the ground level. The capacity of the bin may be increased by making the trestle higher, or by making it longer. As the coal is needed it is fed from this bin to a car on a depressed track alongside. The car is then hauled up the elevated track and dumped into the bin at the foot of the conveyor.

TRACK ELEVATION ON THE CHICAGO, MILWAUKEE & ST. PAUL AT EVANSTON, ILL.

An ordinance was passed in 1908 by the city council of Evanston, a suburb of Chicago, directing the Chicago, Milwaukee & St. Paul to elevate its tracks between Howard avenue and Church street, a distance of about two miles. This work, which is now being done, is especially worthy of attention for two reasons: first, the new and artistic design of the subways, and, second, the methods used to handle traffic during the raising of the tracks.

The subways are of concrete throughout, reinforced slabs resting on reinforced piers and mass abutments. Two views of the finished subways are shown in the accompanying illustrations, one of the illustrations also including a section of the retaining wall, and the other including a distant view of the standard steel girder subway of the Chicago & North Western, whose tracks parallel those of the Chicago, Milwaukee & St. Paul through Evanston. The comparative merits of these widely different types of subways are still in dispute. It is contended by those who favor the concrete type that its first cost is less, that the maintenance charges for it are substantially smaller, and that its appearance is the more pleasing.

As compared with other concrete subways, this design conveys an impression of lightness and beauty of line rather than massive strength and avoids the tunnel-like appearance which concrete subways are apt to have. This is largely due to the greatly reduced section of the columns, which is made possible by spacing them closer together. It has been customary to allow one column per track, or in some designs one and one-half, but in this case two columns per track have been used. In the details of design the same general impression is conveyed by the paneling of the slabs, the small arches between the pillars and the rounding of all exposed corners.

The abutment plans shown in Fig. 3 illustrate an interesting feature of the design. The line is two-track at present, but the addition of a third track is anticipated and all structures are designed to provide for that addition. In the case of the abutments, the footings are carried out to a width sufficient to support the three-track structure, and the rear wall on the side of the future track is stepped down to facilitate the addition of concrete as outlined by the dotted line in the elevation. To avoid unsymmetrical appearance and increased first cost the remainder of the concrete is not to be placed until the third track is built. To prevent the ballast from rolling over the face of the abutment as at present constructed, the wall at the side of the present slab and back of the seat for the future slab is raised to the level of the base of rail. The seat for the third slab is carried out to the proper width to insure that slab a support similar to those provided for the other two.

Fig. 4 shows the details of the piers. The width of the columns is only 18 in., which greatly reduces the obstruction to the street as compared with the 30-in. columns used on some other designs. The small arches between columns are used for the sake of appearance and the arching effect was neglected in the design. The footings at the different streets vary greatly owing to the variable composition of the soil, loam, soft blue clay, quicksand and coarse gravel being found in various combinations. At seven of the thirteen streets intersected a good natural footing of packed gravel was obtained at a depth of 4 to 5 ft. below the surface, and at the other six streets pile foundations had to be driven, the concrete being carried down 7 to 9 ft. below the surface.

The construction of one of the large floor slabs is shown in detail in Fig. 5. The size of these slabs varies greatly, as every street is intersected at a different angle and several subways are located on curves. The Davis street subway is on a 12-deg. curve, and the Chicago avenue subway, shown in the figure, is on a 9-deg. curve and has the maximum intersection angle, 18 deg.-34 min. The slabs are all of one track width with the exception of one subway, where the span is so long that the weight of a full width slab would have been too great to handle, in which case the slabs are of one-half track width. For the purpose of handling, a 1¼-in. round stirrup was placed at each end of the slab with its diverging ends under the reinforcing bars, as shown in the detail drawing. The method of placing the slabs will be described later.

The tracks of the Chicago, Milwaukee & St. Paul, from where its Evanston line originates in Evanston into the northern part of Chicago, are used chiefly by the Northwestern Elevated Railroad, an electric line. The elevated trains stop at four stations on the section being elevated and facilities for handling large numbers of people had to be provided at these points. Small brick stations are to be used with four stairways and a passageway under the tracks to allow passengers to reach the platforms rapidly. The stations are located entirely below the grade of the tracks and are covered with flat concrete roofs, as in some cases the designs for the future third track provide for its passing directly over the station building. The stations of the Chicago & North Western in Evanston are raised to the grade of tracks at much greater expense for footings. The stairways from the station level to the St. Paul's track level and the subway under the tracks are of concrete, the details being shown in Fig. 6. The most peculiar feature of the design is the cantilever construction

used for one stairway. This plan was adopted to shorten the length of the footing and thereby protect the stairways from damage by unequal settling. The same object was sought in making an open joint between the subway and the stairway so that the former may settle appreciably without damaging the latter.

A standard gravity section was used for the retaining wall, but in two cases where special conditions were met, the design was altered. One of these is illustrated in Fig. 7. A team track was to be provided between the tracks of the Chicago & North Western and the Chicago, Milwaukee & St. Paul, to lead from street level to the new track level. As the fill on one side of the wall is at a constant elevation and on the other side varies from zero to full height, the section of wall required at any point is that necessary to withstand the pressure due to a head of fill equal to the difference in elevation on the two sides. As constructed, the mass wall is used at the lower end of the team track for a distance of 175 ft., and for the

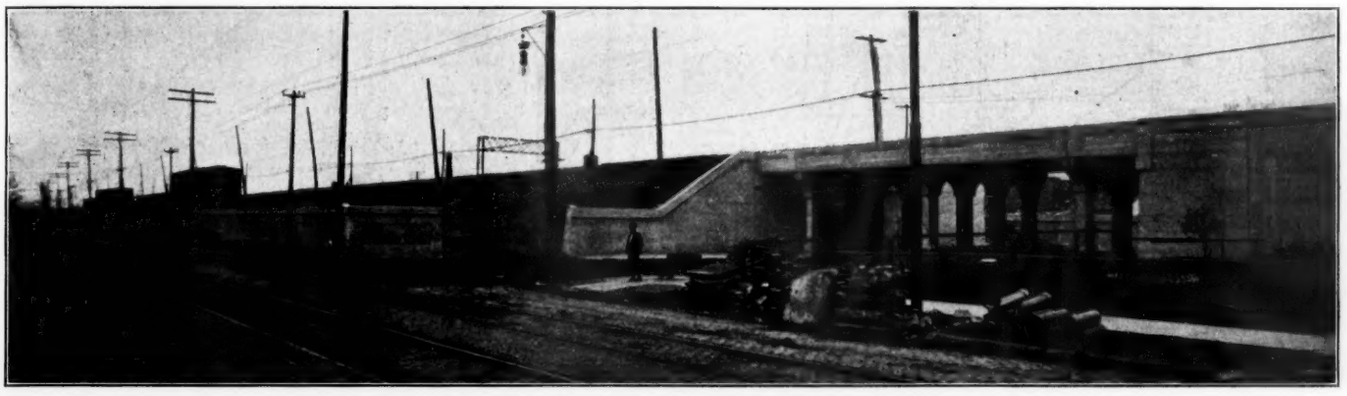


Fig. 1—Subway and Retaining Wall; Evanston Track Elevation of the Chicago, Milwaukee & St. Paul.

Fig. 2—Subway.

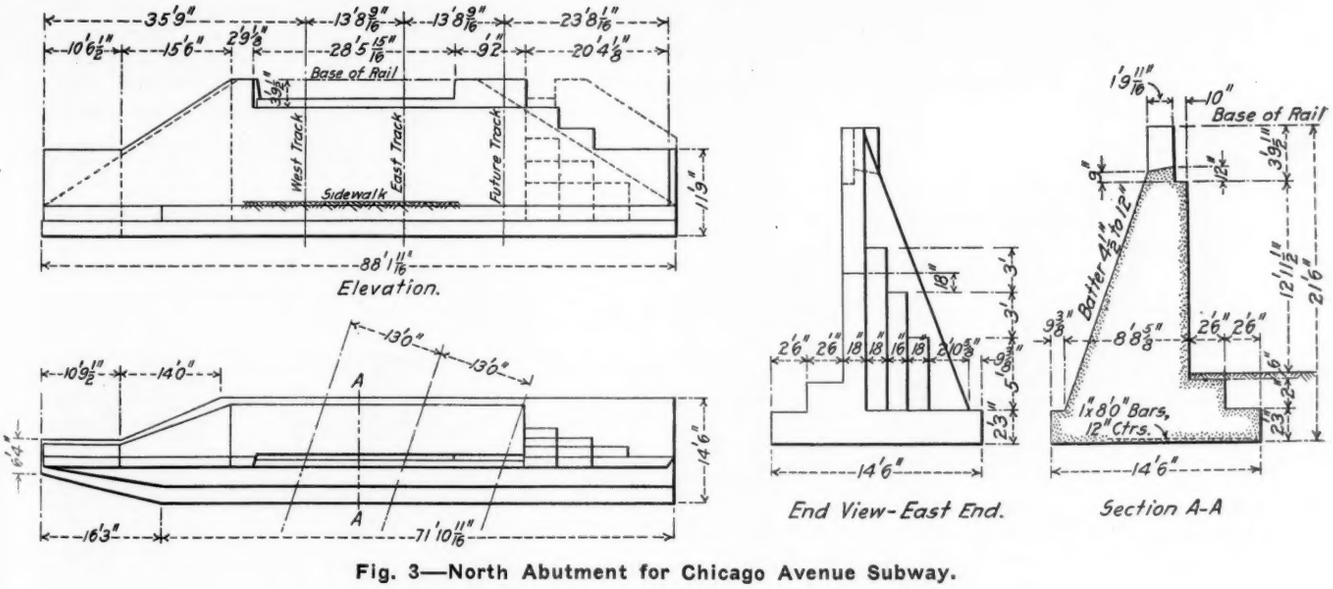


Fig. 3—North Abutment for Chicago Avenue Subway.

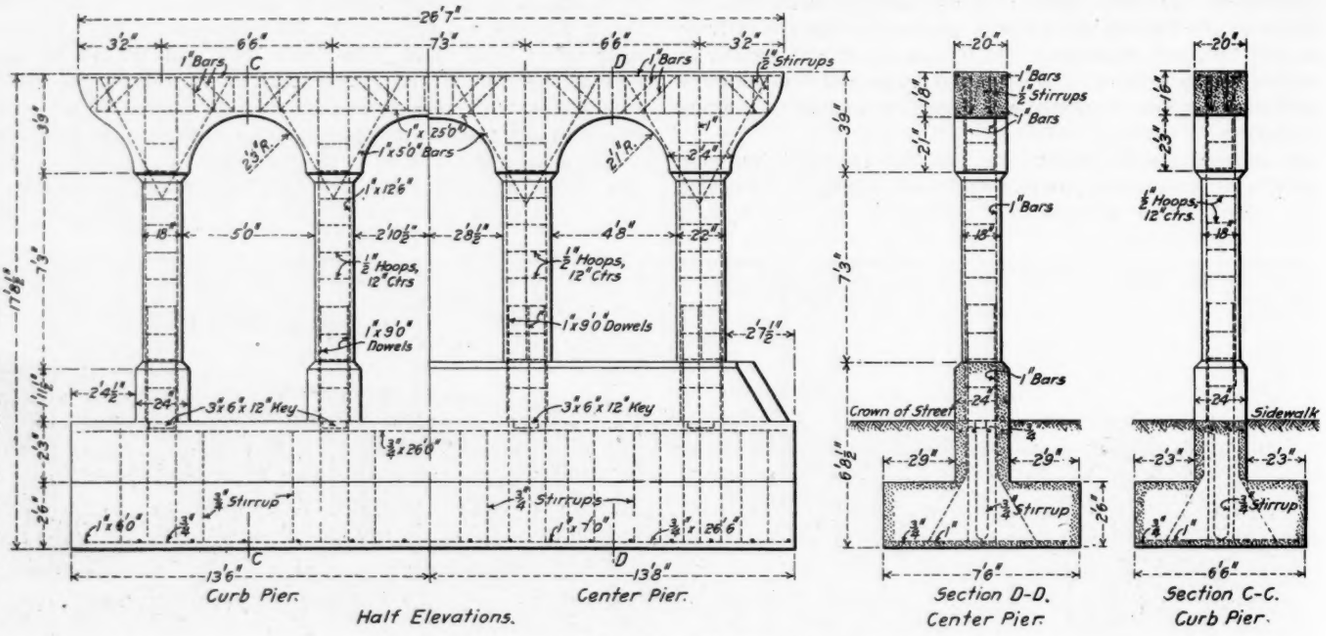


Fig. 4—Details of Piers for Chicago Avenue Subway.

remaining 90 ft. the standard section is abandoned and a reinforced section supported on pillars is substituted, thus effecting a great saving in concrete.

At another point where the right of way is very narrow and no permit could be obtained to extend footings into an alley which parallels the tracks for a short distance, a 1 ft. 9 in., reinforced wall, buttressed on the outside, was adopted in order to economize space. The addition of a third track at this point will require the outer rail to be laid very close to the right of way line and to provide for this a cantilever construction has been worked out to rest on the reinforced retaining wall and support the track directly. As the full height of the wall is not required at present it is only made 8 ft. high, but provision is made for placing the additional height directly on the existing wall when the third track is added. This construction is used for a total distance of about 75 ft. The buttresses are 1 ft. 6 in. wide and are placed about 16 ft. center to center.

The problem of handling the traffic during the work of elevating the tracks was a difficult one. The line was only two-track and the very narrow right of way prevented the laying of a third track for construction purposes. The Northwestern Elevated operates two to five car trains on a ten-minute schedule between 5:30 a. m. and 2:30 a. m., and it was imperative that the regularity of these train movements should not be interrupted. Another factor that added to the difficulty of the problem was the necessity of elevating the trolley wires with the tracks, as the cars are operated on an overhead trolley system.

It is impossible to describe the numerous special problems

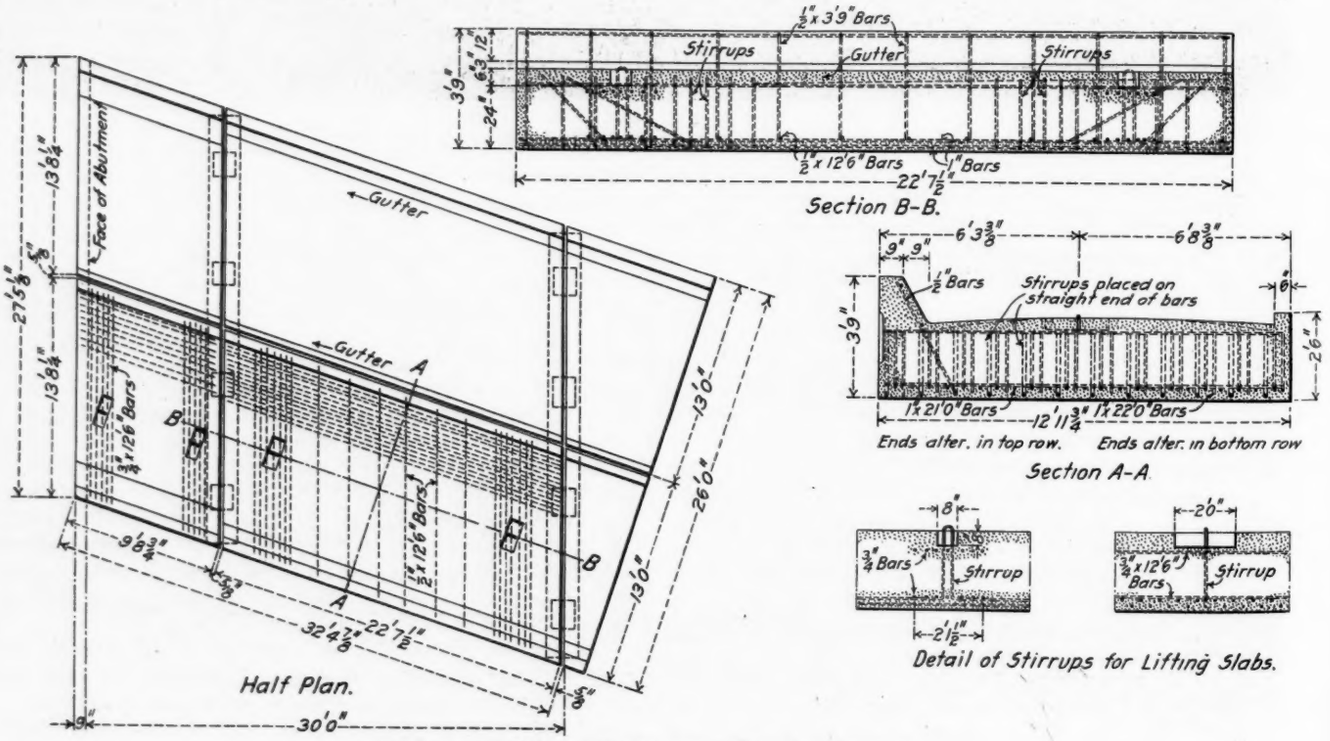


Fig. 5—Details of Reinforced Slab for Subway.

that arose and the original methods used to solve them, but the general plan of the work can be briefly outlined. A point near the center of the work was selected at which to begin work. The tracks were separated as widely as the width of the right of way would permit, a pile trestle giving the full amount of clearance for street traffic was built between the tracks, and enough fill placed at the ends of the trestle to allow one track to be shifted to the false work. Crossovers

Usually the traffic had to be shifted from track to track two or three times before the full height of fill was attained under both tracks. At some streets where it was impossible to raise the track to full height at a single operation, a fill in the street was used in preference to a half height trestle. The street was closed while the fill was being placed and then rock screenings were spread on top, easy approaches formed, and the street traffic carried over the fill. Extra crossing men

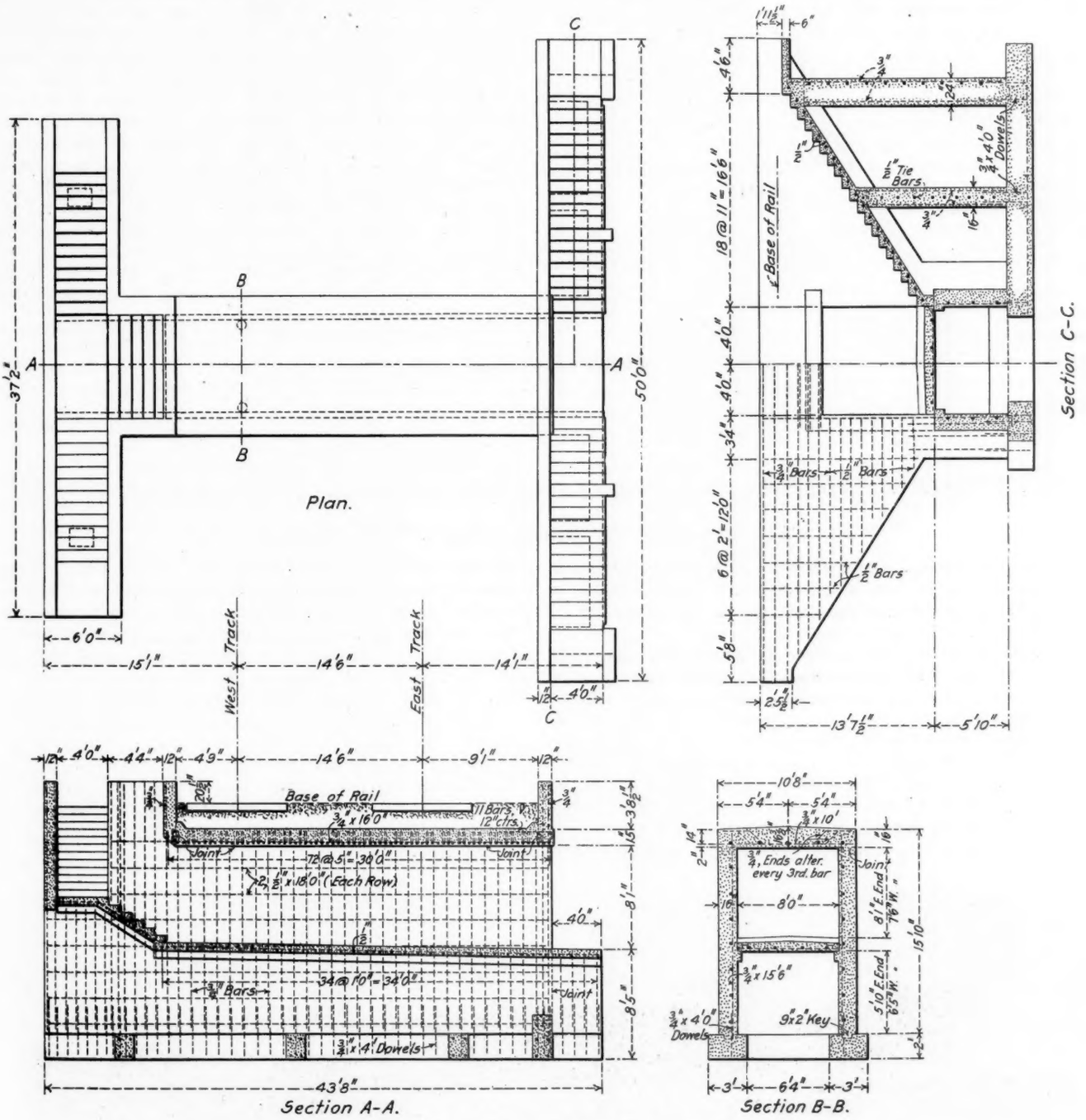


Fig. 6—Stair and Station Subway Details; Evanston Track Elevation.

were placed on both sides of this work and the trains were operated single track over that section until the other trestle could be built and the second track shifted to it. From this beginning the work proceeded in both directions. Sections three or four blocks in length were operated single track, while trestle bridges were built across the streets and the intermediate tracks raised by filling. In most cases the trestles were made full height and the filling was carried up as high as possible without flooding the operating track.

were required at such places, but the interruption to traffic was slight. After the grade in the adjacent blocks had been raised enough to allow it, the fill in the streets was removed and full height trestles substituted. This method was probably cheaper than the driving of two sets of pile trestles and it also served to keep the street open more of the time. Whenever the trains were forced to operate on a single track a pilot was employed, who rode from crossover to crossover, going on one train and returning on the next. This made the

single track operation perfectly safe and the delay in trains was never great.

The material and construction yard was established on a piece of ground about five acres in size at the extreme southern end of the work. The slabs were made here, being arranged in rows along switch tracks to facilitate their being handled. On account of the varying angles on which the subways were built, the forms for the slabs were laid out accurately with a transit. The solid floor to form the bottom of the slab was built first and then the angles accurately turned to establish the four corners of the slab on this floor. The method proved very satisfactory and the exactness with which the slabs fitted in place was an ample reward for the care taken in laying them out.

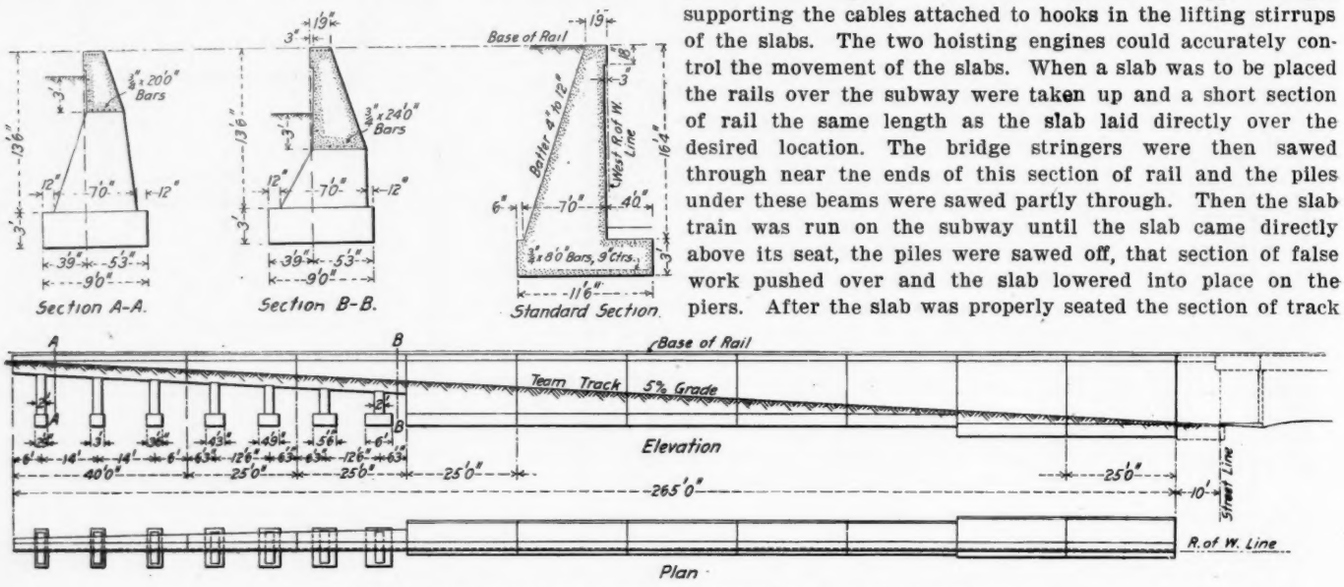


Fig. 7—Retaining Wall Design; Evanston Track Elevation.

The method of placing the slabs was adopted from necessity and proved a very satisfactory one. The weight of the heaviest slab was about 65 tons and the capacity of the largest derrick car available for the long reach required was 50 tons. It was also feared the false work bridges might not be able to support the concentrated load of a derrick car carrying a 65-ton slab. The use of two derrick cars was not possible since, on account of traffic, only the track on which the slab was being laid could be blocked during the operation. The method finally adopted is illustrated in Fig. 8, which shows one of the heavy street slabs being lowered into place. A pair of 75-ft. girders were supported on two 50-ton, steel, underframe, flat cars, the points of support being arranged to allow enough space between the cars for the largest slab to hang free. The tractive effort was transmitted by a king pin in an ordinary truck bolster which was blocked up on the car. A bridge erection derrick car was coupled in front of the two girder cars and a flat car carrying a hoisting engine was coupled behind them. The train was assigned one of the switching engines employed on the work and was always very carefully handled. The girders were placed close together with blocks across the upper flanges supporting the cables attached to hooks in the lifting stirrups of the slabs. The two hoisting engines could accurately control the movement of the slabs. When a slab was to be placed the rails over the subway were taken up and a short section of rail the same length as the slab laid directly over the desired location. The bridge stringers were then sawed through near the ends of this section of rail and the piles under these beams were sawed partly through. Then the slab train was run on the subway until the slab came directly above its seat, the piles were sawed off, that section of false work pushed over and the slab lowered into place on the piers. After the slab was properly seated the section of track was blocked up temporarily on the slab and the train removed. Some of the light sidewalk slabs were placed with a bridge erection derrick car, but for placing the heavy slabs this car was only needed for the hoisting engine it carried. By the use of this train the weight was distributed almost uniformly on the four sets of trucks of the flat cars and allowed the train to be run in safety over all false work.

We are indebted for the descriptive matter and illustrations in this article to C. F. Loweth, engineer and superintendent bridges and buildings of the Chicago, Milwaukee & St. Paul; J. H. Prior, assistant engineer in charge of the design of this work; R. J. Middleton, assistant engineer in charge of construction, and E. O. Greifenhagen, who assisted in the design of the work.

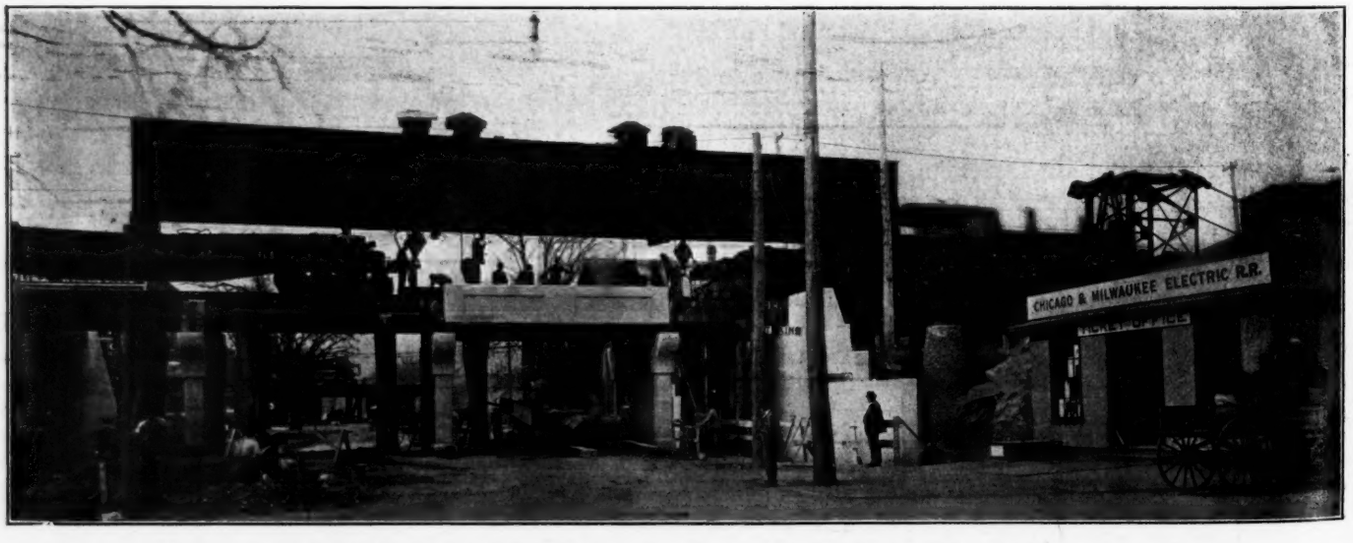
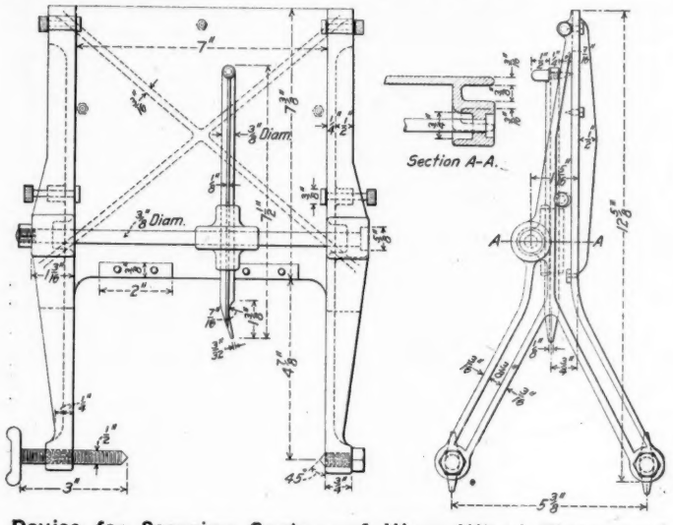


Fig. 8—Slab Train Placing One of the Floor Slabs: Evanston Track Elevation.

TIRE CONTOUR INDICATOR.

A device for getting the profile of worn driving wheel tires, designed by W. C. Arp, superintendent of motive power, and F. F. Hildrith, mechanical engineer of the Vandalia at Terre Haute, Ind., is shown on the accompanying drawing. The tires have center punch marks at a standard distance from the inside diameter. Set screws fit into these punch marks and hold the device in place. The crosshead carrying the stylus



Device for Securing Contour of Worn Wheel Flange and Tread.

has a lateral motion on the ⅜-in. rod and the stylus slides vertically in the crosshead. A pencil point at the upper end of the stylus traces the profile of the flange and tread on a piece of paper placed on the flat plate, which is ribbed on the rear side to insure strength and rigidity. The paper is held in place by the four cams on the ends of the small, short shafts which are turned by the knurled heads.

TELEPHONE TRAIN DESPATCHING ON THE UNION PACIFIC.*

The Union Pacific now has nearly 600 miles of telephone lines nearly ready for use as train despatchers' wires, the line between North Platte and Sidney, 123 miles, which was put up in 1908, having proved highly successful. In addition to these despatching wires, telephones are extensively used "composite" with telegraph instruments on the long-distance copper telegraph wires.

The cost of two copper wires, weighing each 210 lbs. per mile is about $110 a mile; of a despatcher's telephone equipment, $40; station telephone equipment, $20; booths used at sidings and places where there is no operator cost $60; apparatus in booth, $50; selector apparatus at the despatcher's office, $60; selector apparatus at way stations, $30 per station.

Telephone wires are transposed on the poles every quarter mile. In the circuits now being put up there are from 12 to 23 station sets in each, and from 6 to 12 booth sets. At the despatcher's office each despatcher has a separate set. On the North Platte-Sidney circuit a high impedance receiver of about 700 ohms is used, making it possible to use a uniform style of receiver throughout the length of the circuit. By thus placing the most of the impedance in the receiver instead of outside, the working of the line has been improved. At stations not more than 100 miles from the despatcher's office the current for the station apparatus is from three cells of dry battery; at greater distances four cells are used.

With the selector used, the bell at the station need not ring until the operator stops it; the despatcher can stop it at will. The time required to start the bell at a distant station is about eight seconds. By a special winding on the selector magnet, a faint "answer-back" is given. The selector works on the step-up principle.

Mr. Sheldon concludes that despatching by telephones is at least one-third faster than by Morse telegraph, and in some cases one despatcher can manage a district alone where, if the telegraph were used, he would have to have assistants or perhaps have the district divided. A telephone despatching circuit is rather costly, but usually the expense can be saved within the first year of its use.

The telegraph circuits before referred to are four in number, extending from Omaha to Ogden, 1,000 miles. The telegraph instruments on these wires are worked duplex. The wires are transposed on the poles so that two splendid telephone circuits are available all the way. With these telephones conversations are held frequently between Omaha and Cheyenne, 516 miles. Regular telephone operators send messages over these wires every day between the headquarters of the different divisions of the road. For these operators roomy, ventilated booths are provided. Messages received are written directly on the typewriter, and the speed of the service is approximately three times that of the telegraph. This service is maintained both day and night. One of the eight telegraph circuits worked on these wires extends through to San Francisco, with repeaters every 500 miles. For telephone transmission the 1,000 miles of line are separated into five circuits on each pair of wires. The ten telephone circuits thus provided, added to the eight telegraph circuits, handle about 200,000 messages a month.

*From a paper read before the Omaha Railway Club March 9, by J. B. Sheldon, superintendent of telegraph of the Union Pacific.

TWO, THREE AND FOUR TRACK RAILWAYS IN MASSACHUSETTS; TWO TRACK AND FOUR TRACK IN RHODE ISLAND.

Following the maps of double-track railways in the states of Maine, New Hampshire and Vermont, printed in previous issues we show on the next page a similar map of Massachusetts. In this state there are a number of stretches of four-track line; and sections of two-track, three-track and four-track road are distinguished from each other in the map by the thickness of the lines in the drawing. The railways in and around Boston are shown in the lower left-hand corner on a larger scale. That part of the Fitchburg division of the Boston & Maine which lies in Vermont is double-track, and is indicated on this map, no map of Vermont being published. The termini of the sections in Massachusetts having more than one track are as follows:

MASSACHUSETTS. *Boston & Albany.*	No. tracks.
Boston-South Framingham.	4
South Framingham-Charlton (Including 3-track line as shown.)	2
Charlton-East Brookfield...	3
East Brookfield-Washington.	2
Washington-Pittsfield	3
Pittsfield-West Pittsfield...	2
West Pittsfield-State line...	3
Cary Cut-Curtis St. Junction, East Boston.....	2
Riverside-Boston	4
Cottage Farm-Charlestown.	2
Boston & Maine.	
Boston-State line, N. H....	2
Everett Junction-West Lynn	2
Salem-Peabody	2
Beverly-Gloucester	2
Boston-Somerville	2
Boston-Somerville	3
Boston-Atkinson, N. H..... (Inc. 1.53 miles of 3-trk.)	2
Medford Junction-Medford .	2
Lowell Junction-Bleachery .	2
South Lawrence-Lawrence..	2
Somerville-Nashua, N. H...	2
Somerville Junctn-Lexington	2
Winchester-N. Woburn Jctn.	2
Boston-Union Square	2
Union Sq.-W. Cambridge...	4
W. Cambridge-Waltham	2
Waltham-Roberts	3
Roberts-North Pownal, Vt..	2
W. Cambridge-Waltham ...	2
Worcester-Groton	2
Springfield-Greenfield	2
New York, New Haven & Hartford	
Boston-E. Thompson, Conn..	2
Springfield - Thompsonville, Conn.	2
West Roxbury-Needham	2
Worcester-Woonsocket, R.I..	2
Forest Hills-Dedham	2
Readville-Dedham	2
Boston-Readville	4
Readville-Central Falls, R.I.	2
Canton Jctn-Stoughton Jctn	2
Boston-Harrison Square ...	4
Harrison Square-Fall River.	2
Harrison Square-Milton Jctn	2
Raynham-Whittenton Jctn.	2
S. Braintree-Pemberton	2
Nantasket Junction-Cohasset	2
S. Braintree-Whitman	2
Kingston-Plymouth	2
Mayflower Park-Brockton...	2
Brockton-Campello	4
Campello-Buzzard's Bay ...	2
Fitchburg-Pratts Junction .	2
Marlboro Jct.-S.Framingham	2
Walpole-New Bedford	2
RHODE ISLAND.	
Woonsocket-Central Falls...	2
Central Falls-Providence ..	4
Providence-Westerly	2
Providence-Warren	2
India Point-Valley Falls ...	2

Two-Track, Three-Track and Four-Track Railways in Massachusetts and Rhode Island.

General News Section.

The Tacoma (Wash.) *Ledger* says that the Northern Pacific intends to substitute oil for coal as fuel in the switching engines used in Tacoma. Six engines are being changed from coal to oil burners.

The street railways in Cleveland, Ohio, which carry passengers for three cents each, report that for the first month the profit per car-mile is 66 cents, after paying the expenses, and 6 per cent. to the stockholders.

Mexican laborers moving north to work on new railway construction are now passing through El Paso, Tex., at the rate of several hundred a day. Some of these men go as far east as Illinois and as far north as Nebraska.

A fire in the elevator district at Omaha, Neb., on April 4, destroyed about 100 cars standing in the adjacent yards and imperiled the Independent elevator belonging to the Chicago Great Western. This building was saved, however, as its steel sides made it partially fireproof.

A strike of all men employed in the operating department of the Tonopah & Goldfield was reported April 4. All conductors, brakemen, enginemen and firemen walked out. A recent order reducing wages and a refusal of the company to arbitrate brought about the strike.

Studying in the course on railway operation at the Wharton School of Finance and Commerce, University of Pennsylvania, there are now 16 students; five Americans, ten Chinese and one Hindu. This is a mixed graduate and senior course. It is under the charge of Professor Howard G. Brownson.

When the new Chicago & North Western station in Chicago is opened, a postal station will be opened in it which will replace the present Station U in the Union station, as well as the postal station in the present North Western station on Kinzie street. This will be much the largest postal station in Chicago.

The Ohio members of the Railway Business Association have requested the general executive committee of that organization to consider whether or not the association in Ohio should protest against the enactment of a measure for the regulation of public utilities, which was passed by the Ohio House on March 30, and is now pending in the Senate. The measure provides for very detailed regulations of public utilities, including railways.

The Southern Railway is putting into service an equipment for despatching its trains by telephone on the division from Greensboro, N. C., through Lynchburg, Va., about 124 miles of the road having 36 way stations. The equipment is of the latest type furnished by the Western Electric Co., New York, and employing Gill selectors. The regular message work, as well as the trains on this busy division, will be handled by telephone. The company is also equipping its block signal wires with telephones.

Governor Hughes of New York has signed a bill providing for the issuance of 50-year 4 per cent. canal bonds not to exceed $78,000,000, in lieu of 3 per cent. bonds previously authorized but not issued. The New York State Superintendent of Public Works has awarded two additional barge canal contracts as follows: Contract No. 21, from the Genesee river to the East End of contract No. 6, at Rochester, to Lane Bros. Company, Altavista, Va., $1,383,150; contract No. 39, for dredging a channel in the Oswego river from Three Rivers to Fulton, 11 miles, to James Stewart & Co., New York, $1,046,674.

The Railroad Commission of Wisconsin, in making an investigation of the conditions on street railways of Milwaukee, arrives at the conclusion that out of a car full of from 40 to 42 persons, eight prefer to stand rather than sit, regardless of the number of seats provided. The commission says: "A number of reasons might be suggested as explaining this preference. The passengers may wish to stand on the rear platform and smoke; they may prefer to stand on the front platform for observation; or they may have been sitting down all day and prefer to stand for that reason; or having only a slight distance to ride they may not care to go to even the slight trouble of searching for one of a number of available seats." The commission, therefore, arrives at the conclusion that a car having a seating capacity of 42 is only comfortably loaded when it carries 50 passengers. New York Public Service Commission, First district, please note.

Colonel B. W. Dunn, chief inspector of the Bureau of Explosives, has issued a circular to members of the Bureau calling attention to the carelessness of some freight agents in selling at auction, at a loss, freight which is plainly marked with the name of the manufacturer. Money could be saved usually by looking carefully for the name stamped on the package and then getting from the shipper the necessary information as to the ownership of the goods. In the same circular Colonel Dunn warns yard men against allowing cars containing explosives to stand near to fires built by the men on the ground in the yards to warm themselves in cold weather. Instruction is also given as to the best method of destroying explosives by burning. In the annual report of the chief inspector, recently issued, there is an illustration of a vessel suitable for thawing small quantities of dynamite. Having received many complaints of delays to shipments of explosives, the inspector calls attention to paragraph 1685, of the government regulations, requiring that every effort be used to expedite the movement of cars containing explosives. Neglect is a violation of law. Copies of the inspector's annual report may be had at $1 each from W. F. Allen, secretary, 24 Park place, New York city.

Railway Matters in Washington.

Washington, April 6, 1910.

The amendments to the employers' liability law have finally been agreed to by both houses of Congress and President Taft says that he is going to sign the bill. By these amendments state courts are given concurrent jurisdiction with federal courts in dealing with suits for damages growing out of accidents.

The House on Saturday adopted a provision amending the corporation tax so as to provide for publicity of returns in the discretion of the president, rejecting the proposal that returns might be made public on the request of the Senate or the House.

The bill to increase the powers of the Interstate Commerce Commission over safety appliances on freight cars and requiring uniform steps, ladders and running boards, efficient hand-brakes, etc., after much discussion in the committees of both houses, has finally been agreed to by a conference committee and the conference report has been accepted in both houses, so that it will probably become a law at an early day. This bill (H R 5702) was originally presented in the House March 29, 1909, by Mr. Esch. According to the latest draft, it goes into effect July 1, 1911. Besides the provisions referred to, there is a clause empowering the Interstate Commerce Commission to establish a new standard for the height of drawbars.

In the Senate on Monday Chairman Elkins offered three amendments to the "administration bill," designed to meet the criticisms of Senator Cummins and others. One of these makes traffic agreements legal only when approved by the Interstate Commerce Commission, another strikes out the concluding sentence of Section 12 and the third inserts the word "lawful" in that section, so that a road seeking to acquire the stock of another road must already "lawfully" own not less than 50 per cent. of the stock of the road to be acquired. The House Committee finally reported the bill on April 1 with many changes and on Monday of this week voted to take it up immediately after the passage of the naval appropriation bill, which means probably the first part of next week.

Senator Root in his argument for the administration bill addressed the Senate for about two hours on March 30, three hours the next day (Thursday) and again an hour on Friday. He spoke without notes. He said that, personally, he was not much in favor of making new courts; but, in view of the knowledge of those charged with the duty of administering

the Interstate commerce law, he accepted their judgment. The essential principle of the Interstate Commerce law was to facilitate the presentation by the ordinary citizen of his claims against the railways, and the proposed court was an advance step in this direction. It will be wise to have the court in Washington, because the great question now before the government and the public is not that of reasonable rates but of proper *relative* rates. A court sitting in Washington will not be influenced by local considerations. It will be as free and untrammeled as the Supreme Court of the United States. As to the jurisdiction of the proposed court he had no objection to the amplification of the language in this section, if senators desired it, but really it is satisfactory already. It is proper to delegate to the Attorney-General the authority to conduct proceedings in the court on behalf of the government. There is nobody we can trust better than the Attorney-General. It is not businesslike for every board, bureau and separate agency of the government to have its own lawyers.

Speaking of Section 7, Senator Root had no objection to a provision that traffic agreements shall be subject to the approval of the Interstate Commerce Commission; neither did he oppose the elimination from Section 12 of the clause permitting a railway owning half the stock of another to acquire the remainder of such stock. There is nothing in the bill which relieves railways from the full penalties of the Anti-Trust Act, but if any senator is afraid of this permissive clause it can be cut out.

Senator Root defended Section 9, empowering the commission to suspend changes in rates until their propriety can be investigated, and opposed the proposition to allow more than 60 days for such investigation. To allow a long time would be about the same as giving the commission definite authority over rates, which the senator did not believe in.

Railway Regulation in Maryland.

A bill creating a public utilities commission to have supervision over all public service corporations in Maryland has been passed by the legislature of that State, and it is expected that the Governor will sign it. It is patterned after the New York and Wisconsin commissions with the court review provision of the latter State.

Increases in Pay.

Following the announcement of general increases of pay last week on the Pennsylvania and the Philadelphia & Reading, the New York Central, on April 1, announced an increase of 7 per cent. to all employees receiving not more than $200 a month. Yard conductors and yard brakemen will receive three cents an hour additional. Employees of the engineering and maintenance of way departments are excepted, their wages having been recently adjusted, and the exception applies also to the conductors, trainmen and telegraphers, whose committees have recently been in conference with the general manager. The general increase applies also on the Boston & Albany.

The Erie Railroad, following extended conferences, has increased the pay of locomotive enginemen. It is said that in view of the financial condition of the Erie, the enginemen did not stand out for rates as high as those which have been granted on other roads. The difference between the Erie wages and those of other companies will be about the same as before.

The Erie has reduced the working time of the men in all of its shops from 55 hours a week to 45 hours a week; this in consequence of the falling off in freight traffic since the first of April.

The Atlantic Coast Line, following protracted negotiations, has made a new agreement with the Brotherhood of Locomotive Engineers, to hold for two years; and it is said unofficially that the men secure an increase of about 5 per cent. in their pay.

The Boston, Revere Beach & Lynn has increased the pay of all employees 5 per cent.

The Delaware, Lackawanna & Western is negotiating with committees of conductors and brakemen. It is said that the company refuses to pay as high rates as those which have been granted by the Baltimore & Ohio.

The Delaware & Hudson, on April 4, offered its conductors and trainmen an increase of 6 per cent. in pay, but it does not appear that the employees have as yet accepted the offer.

The Norfolk & Western, following extended conferences, has increased the pay of firemen about 5 per cent.

Some of the track laborers on the Delaware & Hudson struck April 1 for an increase of pay from $1.40 a day to $1.70, but it is said that the men returned to work pending negotiations.

Track laborers of the Cincinnati, Hamilton & Dayton struck April 1 for an increase of pay.

Increases of from one cent to one and one-half cents an hour were made April 1 in the pay of conductors and motormen of the Rhode Island Company, which operates most of the street cars in Rhode Island. This company is controlled by the New York, New Haven & Hartford.

On the night of March 31 there was a strike in New York harbor of the pilots and masters on the tug boats of the Baltimore & Ohio, the Central of New Jersey, the Delaware, Lackawanna & Western and the Lehigh Valley railroads. It appears that the other roads doing business in the harbor had made increases in wages, but that the four named stood out. Within one or two days the companies announced that they were moving nearly or all their freight, and the strike seems to have failed.

The new rates of wages agreed to between the New York, New Haven & Hartford and its conductors are based on runs of 157 miles, not 100 miles. The conductors receive $4.20 per 157 miles; ticket collectors, $3.35 for the same distance; baggage masters, $2.75 per 177 miles; brakemen, $2.55 per 170 miles.

A. B. Garretson, president of the Conductors' Brotherhood, says that conductors on the New York Central receive less pay than those on any other prominent road. A conductor running the Twentieth Century Limited express train from New York to Buffalo, 440 miles, receives less than $2 per 100 miles, while the conductor of the Lake Shore & Michigan Southern (controlled by the N. Y. C.) running the same train from Buffalo to Chicago, 525 miles, receives $2.50 per 100 miles. The Baltimore & Ohio has for years paid $2.60 per 100 miles on through express trains and on some other trains, and henceforth will pay $2.68. Freight conductors on the New York Central receive $2.90 and $3 per 100 miles, while on other lines controlled by the New York Central they receive $3.20. On the Baltimore & Ohio freight conductors have received $3.46½ and will now receive $3.63. West of Chicago freight conductors receive $3.80 per 100 miles.

THE NEW BALTIMORE & OHIO RATES.

The increases of pay which have been granted on the Baltimore & Ohio, under the mediation of Messrs. Knapp and Neill, and which have furnished the basis for the settlement of differences concerning wages on a number of other roads, appear, from an official statement, to amount to the following percentages: Passenger conductors 4.76; baggagemen 11.66; brakemen 12.38. Freight conductors, through, 4.77; local, 2.77; freight flagmen, through, 4.39; local, 1.20; brakemen, through, 4.77; local, 1.33. Work train conductors 10.00; flagmen 9.78; brakemen 9.78. These figures represent the average percentage under each heading, and the average increase granted to all classes of trainmen is calculated at 5.44 per cent.

The variety of rates under each head is due to differences in length of runs and other conditions. The principal changes in the rates per mile are: Passenger conductors, old, 2.6 cents; new, 2.68 cents; increase 3.08 per cent.; new minimum rate per month, $125. Baggagemen handing express, old, 1.53 cents; new, 1.65 cents; increase 7.84 per cent.; not handling express, old, 1.38 cents; new, 1.55 cents; increase 12.32 per cent.; new minimum, handling express, $79; not handling express, $75. Brakemen, old, 1.33 cents; new, 1.50 cents; increase 12.78 per cent.; minimum monthly rate, new, $70. Through freight conductors, old, 3.465 cents; new, 3.630 cents; increase 4.76 per cent. Flagmen, through freight, old, 2.42 cents; new, 2.525 cents; increase 4.34 per cent. Brakemen, through freight, old, 2.31 cents; new, 2.42 cents; increase 4.76 per cent.

The yards are classified into three groups: (1) Chicago, Cleveland, Pittsburgh, Wheeling and eight others; (2) Bel-

laire, Columbus, Akron, Johnstown, Chicago Junction and seven others; (3) Grafton and all east thereof; Parkersburg, Mansfield, Fostoria, Huntington and eight others west of Grafton. The new rates in these yards, which are a 6.04 per cent., average net increase over former rates as follows:

	Conductor.		Brakeman	
	Day.	Night.	Day.	Night.
Group 1	$3.50	$3.70	$3.20	$3.40
" 2	3.40	3.60	3.10	3.30
" 3	3.30	3.50	3.00	3.20

A press despatch from Baltimore says that the basis of increase which governed in the foregoing adjustment has been followed in negotiations between the company and the locomotive enginemen, and that the increases will be as follows: Passenger engineers, 2½ per cent.; through freight and helper, 4.76 per cent.; local freight, 4.76 per cent.; work train, 10 per cent. Yard engineers are to be increased practically 5 per cent. No change was made in the provisions of the existing agreement for a 12-hour day in helper service.

WAGES ON THE PENNSYLVANIA.

The advance of 6 per cent. in the wages of all permanent employees of the Pennsylvania Railroad and its controlled companies (including the Cumberland Valley) who now receive less than $300 a month, which was announced last week, is the third general voluntary increase in wages granted by the Pennsylvania in the last eight years. The lines represented employ about 200,000 men, and of these about 195,000 will participate in the increase. This will involve an addition of some $10,000,000 to the pay rolls. In December, 1902, the Pennsylvania made an increase of 10 per cent. to all employees receiving less than $200 a month, and in December, 1906, another voluntary horizontal increase of 10 per cent. was made, so that the present readjustment means a total addition of 28.26 per cent. to the rates paid in December, 1902. There have also been many increases in wages due to promotions, as well as increases for various classes of employees, so that the cost of labor to the system for the year 1910 will be more than 33 per cent. greater than in 1902.

The Pennsylvania has not made a general reduction of wages since May, 1877, when, because of riots and other troubles, reduced earnings made a 10 per cent. decrease necessary. This was restored in March, 1880. In the panic of 1908 the company made no reduction in wages, but reduced forces and furloughed the younger men.

The total payroll in 1909 for the lines participating in the present increase was $131,823,937, and the number of men receiving this money was 189,721. This was divided as follows:

	Employees.	Wages.
Pennsylvania	123,455	$87,068,100
Cumberland Valley	1,830	1,120,944
Pennsylvania Lines West	55,032	36,425,599
Vandalia	5,346	4,375,878
Grand Rapids & Indiana	2,658	2,133,416
New York, Phila. & Norfolk	1,400	700,000
	189,721	$131,823,937

The forces have been largely increased since the first of the year; so that the increase on the lines east of Pittsburgh will make the wage cost for the year 1910 about $100,000,000.

The New Jersey Public Utilities Law.

The full text of the new public utilities law of the state of New Jersey is found in chapter 41 of the session of 1910. The complete act fills only three small pages, and substantially the whole of its requirements were given in our report of March 25, page 840. The law applies to every railway, express, street railway, traction, canal, subway, pipe line, gas, electric light, heat and power, water, sewer, telephone, telegraph or other corporation, association or joint stock company, operating within the state of New Jersey for public use, under privileges granted by the state or by any municipality thereof.

Governor Fort in signing this bill issued a statement defining his attitude toward the measure. The governor is satisfied as to the constitutionality of the bill. Continuing, he says: "It is a long step in advance. If it did nothing else than give the commission power to inquire into and expose unjust exaction and to inhibit unjust discriminations as to rates and charges—which it clearly does—it would be unfortunate if it should fail of enactment. But it does go further, in that it confers upon the Utilities Board in the strongest language possible power to compel safe and adequate service by all utilities companies. Under this power proper and safe car service can be required.

"The commission has no power to fix rates under this act, even upon complaint, but it can investigate rates (on its own motion) and examine witnesses and let the public know the truth as to the cost of furnishing gas, electric light, telephone service and the like.

"The eighth section prevents the granting of privileges or franchises by municipal bodies until approved by the board, and it can only approve after hearing, which assures the public an opportunity to oppose. This power I regard of the utmost importance. Most of the scandals of the past and all the perpetual privileges granted have been due to the influence, not to say corrupt manipulation, of local municipal or county boards.

"Of course, there are serious omissions in the bill. It should contain a rate making clause, giving the commission power to fix rates upon complaint by a municipal board or a given number of citizens. * * * I approve the act in order that the principle may be established and the act made a basis to build future legislation upon which shall be more effective."

Agreement for Arbitration with Firemen.

As was stated by the *Railway Age Gazette* in its issue of April 1, page 906, an agreement has been signed by the representatives of the Brotherhood of Locomotive Firemen and Enginemen and the conference committee of general managers representing the railways west of Chicago for arbitration under the Erdman act of the wages and of the matter of representation of this union on these roads. The demands of the firemen which are to be submitted to arbitration and the agreements reached regarding them are as follows:

"ARTICLE I.—(a) Firemen in main line and branch passenger service shall be granted an increase of 25 cents per 100 miles or less.

"(b) Firemen in through and irregular freight, mixed, work, wreck, gravel, helper, pusher, snow-plow and branch service (except Mallet type engines) shall be granted an increase of 40 cents per 100 miles or less; provided, that on simple engines having cylinders 24 in. or over in diameter and on compound engines weighing 215,000 lbs. or more on drivers, firemen shall receive not less than $3.85 per 100 miles or less.

"(c) Firemen in local or way-freight service shall be granted an increase of 10 per cent. over through freight rates, as established at this conference.

"(d) Firemen on Mallet type engines shall receive $4.20 per 100 miles or less in all classes of service. This rate shall also apply on lines where the schedules provide for trip basis in helper or pusher service, in accordance with rules in effect.

"(e) Firemen in yard service shall be granted an increase of 35 cents per day.

"(f) Where rate of pay is provided for transfer service, firemen shall be granted an increase of 35 cents per day.

"(g) On lines where rates of pay are negotiated through the B. of L. F. & E., committees for hostlers, switch engineers and engine despatchers, such employees shall be granted an increase of 50 cents per day.

"(h) The above increase shall be based on rates of pay in effect January 1, 1910, except that the differential as between through and local freight shall be based on the through freight rate established at this conference. Overtime shall be paid pro rata.

"*Agreement.*—Request in this article to be submitted to arbitration under the provisions of the Erdman Act, waiving the right of appeal, the award of the arbitrators to be final and conclusive. Agreement as to such arbitration to be signed as soon as practicable.

"ARTICLE II.—Any engineer, fireman or hostler feeling himself aggrieved, may be represented before the proper officials of the company by a committee of enginemen of his own selection. The right of appeal to the highest authority is conceded, and on such appeal he may be represented by the committee or by an officer of the organization of enginemen of which is a member. Note.—The word "engineer" shall

be construed to include electric or motor engineers, and the word 'firemen' shall include helpers on electric or motor engines.

"*Agreement.*—The managers' committee recommends that no change be made in the rules or the actual practice of any company which shall deprive any individual employee of any right or privilege of being represented which he now possesses."

Final agreements were reached and signed governing the question of seniority and some other matters. The agreements regarding these matters are as follows:

"*Article III.*—(a) Firemen shall be examined for promotion according to seniority on the firemen's roster; and those passing the required examination shall be given certificates of qualification, and when promoted shall hold their same relative standing in the service to which assigned.

"(b) If for any reason the senior eligible firemen are not available and a junior qualified fireman is promoted and used in actual service out of his turn, whatever standing the junior fireman so used establishes shall go to the credit of the senior eligible fireman. As soon as the senior fireman is available he shall displace the junior fireman, who shall drop back into whatever place he would have held had the senior fireman been available and the junior fireman not used.

"(c) As soon as a fireman is promoted he will be notified in writing by the proper official of the company of the date of his promotion and unless he file a written protest within 60 days against such date he cannot thereafter have it changed. When a date of promotion has been established in accordance with regulations, such date shall be posted and if not challenged in writing within 60 days after such posting no protest against such date shall afterwards be heard.

"(d) No fireman shall be deprived of his right to examination nor to promotion in accordance with his relative standing on the firemen's roster, because of any failure to take his examination by reason of the requirements of the company's service, by sickness or by other proper leave of absence. Provided that upon his return he shall be immediately called and required to take examination and accept proper assignment.

"*Article IV.*—(a) It is understood that upon lines where higher rates of pay or better conditions are now in effect the propositions herein agreed to shall not in any way interfere with such existing rates of pay or conditions.

"(b) General chairmen and their boards shall not be debarred from taking up with their respective managements matters not acted upon at this conference.

"This agreement signed in triplicate day and date above written [March 23]. The rules granted to be effective as of this date, and the arbitration award to be effective in accordance with its own provisions."

W. C. Nixon, vice-president and general manager of the St. Louis & San Francisco, was chairman of the committee of general managers which negotiated with the firemen.

A member of this committee writes as follows to the *Railway Age Gazette:*

"You will see that the Erdman Act has been used as an instrument to prevent a strike of firemen from occurring. Canada has an act which makes it unlawful for a strike to occur without having first resorted to mediation through the government sources. While the Erdman Act does not go quite this far, its moral effect accomplishes almost the same result.

"The labor organizations are the fathers of the Erdman Act, and they do not appreciate this one phase of it. Perhaps they may object to other parts of it, but this, I believe, is the most objectionable to them. It goes without saying, however, that it is a very good thing for the public, and the railways appreciate it, for they do not want strikes to occur; but if the railways must submit to arbitration and abide by its consequences and increase wages when they cannot afford to do it and when employees are not entitled to it, the increase, if any, should be given to the employees and forced upon the railways by the same tribunal that has the same authority to increase their revenue, i.e., the Interstate Commerce Commission, under whose jurisdiction, in my opinion, the practical operation of this law should be left. I do not think that a special tribunal, independent of the body responsible for regulating rates, should be given the power to increase wages. It should be done by the Interstate Commerce Commission as a part of its duties, with the assistance, of course, of the United States commissioner of labor. The law will never be acceptable to both sides unless the government officials have charge of its operation. In other words, the plan of having it operated by the chairman of the Interstate Commerce Commission and United States commissioner of labor is the proper way to have it handled."

Details of Award in Arbitration of Wages of Chicago Switchmen.

As was stated by the *Railway Age Gazette* in its issue of March 25, page 842, the board appointed under the Erdman Act to arbitrate the differences between certain Chicago railways and their switchmen belonging to the Switchmen's Union of America resulted in an award by the majority of the board, giving the employees an increase of wages of three cents an hour. This board was composed of S. E. Heberling, C. R. Gray and S. S. Gregory. The following are some of the findings of the majority:

"We find that since 1906 the cost of living in Chicago and the territory immediately adjacent thereto is considerably increased. It is impossible for us to measure this increase accurately, but we find that it has been, approximately, 25 per cent.

"We also find that with larger engines and cars, as compared with 1906, the relative efficiency of switchmen has increased, and each man handles larger tonnage. We are also inclined to the opinion that the individual efficiency or expertness of switchmen is somewhat greater than in 1906.

"We find that there have been wage increases in many, if not most, other crafts and callings since 1906 in Chicago; that these increases have been considerable in some lines.

"We find that, on the whole, hazards of employment to the yardmen have not increased since 1906; that the tendency of improved equipment and methods now in use is to reduce the risks of such employment, although it still remains that switching is a highly hazardous occupation.

"While this subject is involved in some difficulty and obscurity, we find, as our best impression from the evidence, that the actual average monthly earnings of switchmen in the Chicago district, for those who work what is called full time, runs from about $85 to $100 per month. This would be, approximately, on the basis of 27 days' work in each month, at 10 hours a day. For short periods many switchmen can earn much more than this, working Sundays and very long hours per day.

"The evidence relating to the ability of the railways to meet an increase in their expenses has been supplemented somewhat by excerpts from the Manual of Statistics—1909. It is shown that late in 1902, and again in 1906, increases were granted the switchmen, and that immediately following increases were granted to the engineers, firemen, conductors and brakemen.

"Mr. Jackson (C. & E. I.), Mr. Moon (L. S. & M. S.) and Mr. Schoyer (Penn.) testified that from their experience an increase to the switchmen would reflect itself throughout the other transportation department employees.

"We find from the evidence and the Manual of Statistics that the Lake Shore & Michigan Southern, the Michigan Central, the Chicago, Rock Island & Pacific, the Chicago & Eastern Illinois and the Wisconsin Central are dividend-paying properties (the latter having paid one dividend in its existence). The Chicago Terminal Transfer, the Chicago Great Western and the Pere Marquette have not earned the interest upon their bonded indebtedness for the past three years.

"The board is clearly of the opinion that it is unfair to consider wholly the effect an increase in wages might have upon that road which is least able to bear it, and by the same token could not consider the situation from the standpoint solely of the most prosperous roads. All of this showing is persuasive, and the board in its finding has endeavored to adapt itself to the average of the lines, rather than upon either extreme.

"We are of the opinion, however, that the interests of those holding the stocks and securities of all of these companies require the continued operation of these lines.

"This being so, we are also of opinion that these companies

must be regarded as able to pay operating cost, including, of course, just and reasonable wages to the class of employees parties to this arbitration.

"We find also that the cost of equipment and railway supplies to the railways concerned in this arbitration has considerably increased since 1906.

"We overrule the suggestion made for the roads that this must be considered as separate arbitration between each of the roads concerned and its switchmen, or that the pecuniary ability or financial situation of each road must be considered separately and this treated as an arbitration severally with each road. We do not find that it is improper to consider the pecuniary circumstances of each railway, but we do find that under the agreement this is a joint arbitration to which there are virtually two parties and that it must be treated accordingly.

"We also overrule the suggestion made for the railways that for this board to make an award against a road not earning its operating expenses would be to deprive such road of property without due process of law. We rule, on this proposition that upon the principle *volenti fit non injuria*, our authority being derived from the agreement of the parties, this must be deemed a voluntary concession on the part of the railway."

DISSENTING OPINION.

Mr. Gray in his dissenting opinion says:

"It is apparent from the award of the majority that the increased cost of living has been regarded as fundamental, regardless of the fact that not one of the witnesses introduced by the proponent would admit this to be true.

"The increased efficiency per man is also regarded as fundamental, although the evidence was not specific in this respect and it is necessary to disregard the exhibit introduced by the proponent, consisting of a graphic chart taken from the reports of the Interstate Commerce Commission and which shows that the tonnage efficiency per trainman (including switchmen) has increased in an eight-year period something like 2 per cent., while the wages of switchmen have been increased during the same period 23.9 per cent.

"I regret exceedingly that I feel compelled conscientiously to dissent, and I base my opinion solely upon the fundamental principle that until a greater income can be insured to at least three of the parties involved in this controversy an increase in wages cannot be granted without inflicting irreparable injury.

"It was shown in the evidence that the income of the railways per passenger mile and per ton-mile are constantly decreasing; that the individual states have, by statute, reduced the passenger rate 33⅓ per cent.; that state commissions and the Interstate Commerce Commission are and have been constantly engaged in making reductions in rates which are far-reaching in their immediate application, and even more so in their ultimate results.

"I feel also that the tonnage efficiency is an imperfect fundamental, because it varies day by day according to the flow of business and the change in the unit (car or engine) employed. It is also unstable as a theory because the employees themselves do not recognize it as between yards or as between crews. They would not admit it to be a fundamental upon which a reduction in wages should be allowed, if from any cause the average tonnage per man should be reduced. It is further unstable because its application serves to directly withdraw from the railway any opportunity through the payment of vast sums of money in the purchase of heavier engines and heavier cars to recoup themselves for wage increases already granted.

"I appreciate that the laborer is worthy of his hire, but I cannot admit that to do justice to the one we must disregard those fundamental principles which we know, and have been shown through evidence to arbitrarily control an employer's income."

Brotherhoods' Meeting at Worcester.

At Worcester, Mass., on Sunday last there was a national joint meeting of the Order of Railway Conductors, the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen and Brotherhood of Railroad Trainmen. Speeches were made by President William H. Taft, Governor Eben S. Draper, President William C. Brown, of the New York Central; President Charles S. Mellen, of the New Haven; President Lucius Tuttle, of the Boston & Maine, and Edgar E. Clark, Interstate Commerce Commissioner; also by the brotherhood leaders: A. B. Garretson, of the Order of Railway Conductors; P. H. Morrissey, of the American Railway Employees' and Investors' Association; W. S. Carter, of the Brotherhood of Locomotive Firemen and Enginemen; W. G. Lee, of the Brotherhood of Railroad Trainmen, and Warren S. Stone, of the Brotherhood of Locomotive Engineers.

Among other things, President Taft said: "I believe in labor organizations, and if I were skilled enough to become a member I should apply for membership. But in spite of my sympathy with organized labor, I put above them, above everything, the right of every man to labor as he will, to earn the wages that he will and, if he chooses, to stay out of labor organizations. Labor must organize to be on equality with its employers and the capital that the employers have. It is by such organization and by proper methods it can secure the wages to which it is entitled. I am trying to get through a bill amending the interstate commerce law; and one of the objections to my bill is that I consulted six railway presidents before I made my recommendation. * * * I consulted shippers; I consulted the Interstate Commerce Commission; I consulted everybody that had an interest. * * * I am not afraid to consult railway authorities in determining whether a law ought to be put on the statute books. I am not bound to follow what they recommend, but am bound to give them a hearing.

"* * * The employers' liability act for interstate commerce employees has now been amended in such a way as to leave to the jury the question as to how far the man's fault entered into the accident, and leave to it the amount that ought to be deducted by reason of the negligence. That is hard on railways. It is harder on railways than the old rule of law was, but it means that the loss is to go in the expense of the railway and ultimately if the rates are properly fixed it has to come from the public; in other words, that in the case of those whose lives are exposed in perilous employment like this for the benefit of the public, the people may well divide that loss among them."

American Society of Civil Engineers.

At the meeting held on April 6 the following papers were presented for discussion, and illustrated with lantern slides: The New York Tunnel Extension of the Pennsylvania Railroad, The Terminal Station West, by B. F. Cresson, Jr., M. Am. Soc. C. E., and The New York Tunnel Extension of the Pennsylvania Railroad, The Bergen Hill Tunnels, by F. Lavis, M. Am. Soc. C. E.

International Railway General Foremen's Association.

The annual convention will be held at the Grand Hotel, Cincinnati, Ohio, May 3-7. Papers on the following subjects will be read and discussed: "The Best Method of Cleaning Ash Pans to Conform to the Interstate Commerce Law"; "The Use of Commercial Gas as Fuel"; "The Advisability of Installing Hot Water Washout and Filling Systems"; "The Use of Oxy-Acetylene Process of Welding Fireboxes, Boiler Sheets, Frames and other Locomotive Work"; "Wide Firebox"; "Superheaters"; "Location of the Point of Water Delivery."

New York Railroad Club.

At the regular meeting to be held on April 15, a paper entitled Stresses Developed by Collisions of Freight Cars will be presented by Colonel B. W. Dunn, chief inspector of the Bureau for Safe Transportation of Explosives.

Canadian Society of Civil Engineers.

At the meeting of the general section, held on April 7, a paper, entitled, "The Fort William Water Supply," by H. S. Hancock, Jr., A. M. Can. Soc. C. E., was given by R. S. Lea.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; May 10-13; Indianapolis.
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; June 7, 1910; Niagara Falls, Ont.
AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.
AMERICAN ASSOC. OF LOCAL FREIGHT AGENTS' ASS'NS.—G. W. Dennison, Penna. Co., Toledo, Ohio.
AMERICAN ASS'N OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew Bldg., Cincinnati, Ohio; during first week in month.
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.—R. W. Pope, 33 West 39th St., N. Y.; 2d Friday in month; New York.
AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 18; New York.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—S. F. Patterson, B. & M., Concord, N. H.
AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASSOC.—E. H. Fritch, Monadnock Bldg., Chicago.
AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis; second Tuesday, May; Memphis, Tenn.
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Building, Chicago; June 20-22; Atlantic City.
AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.; July 12; Chicago.
AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia.
AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; New York.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., N. Y.; 2d Tues. in month; New York; May 31-June 3; Atlantic City.
AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.—B. V. Swenson, 29 W. 39th St., New York.
ASSOCIATION OF AM. RY. ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; June 29, 1910; Colorado Springs.
ASSOCIATION OF RAILWAY CLAIM AGENTS.—E. H. Hemus, A., T. & S. F., Topeka, Kan.; May 25-27; Chattanooga, Tenn.
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Wisconsin Central Ry., Chicago; May 16-20, 1910; Los Angeles.
ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Pl., N. Y.; June 21-22; Colorado Springs.
BUFFALO TRANSPORTATION CLUB.—J. N. Sells, Buffalo.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, Montreal, Que.; Thursdays; Montreal
CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Second Monday in month; Chicago.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton Bldg., Pittsburgh.
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R. R., Richmond, Va.; June 15, 1910; California.
GENERAL SUPERINTENDENTS' ASSOC. OF CHICAGO.—Third Wednesday in month; Chicago.
INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., N. Y.; May 24-27; Niagara Falls, Ont.
INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 23-26; Chicago.
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.; May 3-7; Cincinnati.
INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASS'N.—A. L. Woodworth, Lima, Ohio; Aug. 16-18; Detroit, Mich.
INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11, Brussels; July 4-16; Berne, Switzerland.
IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago; June 15-17; Atlantic City.
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass., 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
NORTH-WEST RAILWAY CLUB.—T. W Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.
NORTHERN RAILWAY CLUB.—Fourth Saturday in month; Duluth, Minn.
OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Blk.; 2d Wednesday in month
RAILROAD CLUB OF KANSAS CITY.—Third Friday in month; Kansas City.
RAILWAY ASSOCIATION OF SPECIAL AGENTS AND POLICE OF U. S. AND CANADA.—May 10-13; Los Angeles, Cal.
RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.
RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C., Collinwood, Ohio; May 16-18; St. Louis.
RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASS'N.—H. M. Buck, Secy.-Treas., 30 Church street, New York.
RICHMOND RAILROAD CLUB.—Second Monday in month; Richmond, Va.
ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.
SHORT LINE R. R. ASSOCIATION.—First Monday in month; New York.
ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, 1134 La Salle St. Station, Chicago
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. H. O'Donnell, Bogalusa, La.
SOUTHERN & SOUTHWESTERN R.R. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., Mar., July, Sept. and Nov.; Atlanta.
TRAFFIC CLUB OF NEW YORK.—C. A. Swope.
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R. R.R., East Buffalo, N. Y
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg; 2d Monday, except June, July and August; Winnipeg.
WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony Bldg., Chicago; 3d Tuesday each month, except June, July and August; Chicago.
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; Wednesdays, except July and August; Chicago.

Traffic News.

A press despatch from Montreal says that the Grand Trunk will make reductions in the rates on export grain to meet those recently made by the New York Central from Buffalo to Boston.

The Western Trunk Line Committee has decided to withdraw its notice that shippers will in future be required to pay for copies of tariffs mailed to them. It is probable that the Southwestern Freight Tariff Committee will take similar action.

Atlanta is the last city at which the merchants have protested against the adoption of the National Car Demurrage rules. It is quite plain that merchants do not like to pay for the use of freight cars as storehouses, if they can get such use without paying for it.

On Sunday, the third of April, 17 special trains, carrying 6,000 immigrants, passed through Montreal from Halifax and St. John bound for western Canada. Very large numbers of immigrants are coming into western Canada from the central part of the United States.

At Philadelphia, March 29, the Bethlehem Steel Company was indicted by the grand jury, in the Federal court, for receiving from the Lehigh Valley and the Philadelphia & Reading unlawful concessions on demurrage charges. The grand jury had already indicted the railway companies for these offenses.

The Duluth Traffic Committee has a stack of postal cards, said to be large enough to fill a library, showing the date of arrival at destination of innumerable shipments of freight made by the wholesalers of that city, who claim that the railways are not giving Duluth fair treatment, as compared with their treatment of other cities. The information on these cards is to be tabulated.

On April 1 the American Express Company succeeded the Pacific Express Company in handling express matter on the lines of the Union Pacific Railroad and the Oregon Railroad & Navigation Company. On May 1 it will take over the express business of some others of the subsidiary lines of the Union Pacific, and on September 1 it will take over the express business of the San Pedro, Los Angeles & Salt Lake and the Las Vegas & Tonopah.

The Southwestern Tariff Committee has directed its chairman to ask the traffic officers of the Mexican lines for a conference at the time of the regular meeting of the committee in New York in May. The Mexican railways are making an effort to divert the bulk of the traffic between their country and the United States to routes by way of their southern ports, Tampico and Vera Cruz, in order that they may get longer hauls and more favorable divisions of the through rates.

Steps are being taken by the railways of the country toward the adoption of uniform practice in the making of special rates for conventions, etc. A conference on this subject will be held in New York early in May. The following committee has been appointed to represent the Western Passenger Association lines: (W. B. Kniskern (C. & N. W.); L. M. Allen (C., R. I. & P.); A. L. Craig (C. G. W.); W. J. Black (A., T. & S. F.), and E. E. McLeod, chairman of the Western Passenger Association.

Grain dealers in Philadelphia say that the railways have agreed to give them 24 hours' free time for reconsigning carloads of grain from the West. It appears that on much of the grain bought by these merchants the destination is changed at Buffalo, Altoona or some other point on the road, and that they have to pay $2 a car on every car stopped for that purpose, even if the stop be for only an hour. But they have been importuning the railways for over a year and now have got the concession noted, which some of the grain men say will save them $200,000 a year. To the man in the street this statement naturally suggests the query why the telegraphic orders for change in destination could not be sent a little earlier and thus avoid this costly delay. The sum named

represents presumably 100,000 cars standing idle 100,000 days.

The presidents of the Wabash, the Chicago & Alton, the Illinois Central, the Burlington, the Big Four, the Missouri Pacific, the St. Louis, Iron Mountain & Southern, the Vandalia, the Southern and the Missouri, Kansas & Texas have signified to Mayor Kreismann, of St. Louis, their willingness to confer with the joint committee of the municipal assembly regarding the assembly's demand that all bridge arbitraries across the Mississippi River to and from St. Louis shall be abolished. Four railways which belong to the Terminal Railroad Association have yet to be heard from. These are the Baltimore & Ohio, the St. Louis & San Francisco, the Rock Island and the Louisville & Nashville. April 20 has been fixed tentatively as the date for the conference.

The rates on export grain from Buffalo to Boston for the coming season of late navigation (beginning May 1), as announced by the New York Central, are as shown in the table below, the rates in the first column being those which were in effect last year. This very considerable reduction has been made to meet the demands of the shippers that the railway co-operate with them in meeting the severe competition of the lines through Montreal.

	Per bushel.	
	Old rates.	Effective May 1, 1910.
Wheat	5½	4
Corn	4¾	3¾
Rye	5½	3¾
Barley	4¾	3½
Oats	3.7	3

Pacific Coast Lumber Trade.

San Pedro, a name almost unknown east of the Mississippi, is to-day one of the biggest lumber-receiving ports of the country. The gazetteers of eight years ago described San Pedro in four lines "a bay and inlet of the Pacific ocean, in California, 105 miles southeast of Santa Barbara." That was all. To-day it is the ocean port for the great commercial activity that centers about Los Angeles. It received last year over 500 million board feet of lumber; redwood, fir and yellow pine, brought in by coast vessels from the forests of the Northwest. The arrivals of redwood, pine and fir at all the ports of San Francisco bay totaled 900 million feet. The fruit-growing section of southern California consumes much lumber, most of which is cut a full thousand miles to the north, and Washington, Idaho and Oregon lumber is also distributed by rail from southern California to many inland points.

Proposed Advances in Freight Rates in the West.

The rate clerks of western railways are checking over the tariffs with a view to finding on what commodities advances in rates may most satisfactorily be made. The roads already have advanced most of their rates on dressed beef. They have announced advances in the rates on coal from the Illinois and other fields. The new coal tariffs, however, have not been filed, as the railways have acceded to the request of shippers for conferences before putting them in effect. One conference was held in Chicago on March 31. Another was held on April 6. It was originally intended to put the higher rates into effect on April 1. The plan now is to file the tariffs about April 12, making them go into effect on May 15.

It is proposed to advance the rates on the better grades of brick. The same rates are not made in western territory on ordinary brick as on kinds of greater value. Other commodities on which advances in rates are being considered are cement, drain pipe and tile, sewer pipe, iron and steel articles and agricultural implements.

The rate on cattle from the Missouri river to St. Louis will be advanced from 14¾ cents to 17 cents per 100 pounds, and on hogs from 17½ cents to 18½ cents. The present rate on both cattle and hogs from the Missouri river to Chicago is 23½ cents. As the rates from Chicago to New York are 5 cents less on both cattle and hogs than from St. Louis, the advance from the Missouri river to St. Louis equalizes the rates on hogs from the Missouri river via Chicago and via St. Louis to the east, and comes within 1½ cents of equalizing the rates on cattle. These advances in the rates on cattle and hogs from the Missouri river to St. Louis were made largely as a result of protests from Chicago live stock men that they were being discriminated against as compared with live stock dealers at St. Louis.

It is not probable that the class rates in western territory will be materially changed, as many of them are fixed by orders of the Interstate Commerce Commission or by maximum rates fixed by the Illinois, the Missouri, the Iowa and other state commissions.

INTERSTATE COMMERCE COMMISSION.

Informal Rulings Made in Conference.

The commission will not recognize, as a basis for reparation, any rate that is not on file with it.

A carrier cannot lawfully transport free of charge and deliver to a connection the household goods of an employee who has left its service to accept a position with another carrier.

Tariffs authorizing allowances for grain doors do not conform with Rule 78 of Bulletin No. 4 unless they state both the maximum allowance per car and the maximum allowance per grain door.

The destruction of canceled tariffs that have been posted at the stations of a carrier is not regarded by the commission as an offense under section 20 of the act so long as a copy of the same tariff is preserved by the carrier in its general files.

The purpose of the rule requiring the domestic carriers to publish their divisions of rates to and from Mexico is to give to this commission definite information as to their lawful earnings and was not intended as a means of exercising any jurisdiction over carriers in Mexico.

With respect to shipments that move on and after March 1, 1910, it will be the policy of the commission not to authorize the waiver of any uncollected undercharge that is not brought to the attention of the commission within 30 days after the date of the delivery of the shipment.

When a shipment leaves a point of origin in a single car and for the convenience of the carriers is transferred in transit into two cars and is subsequently detained by consignee at destination beyond the free time, demurrage should be assessed as for one car only, so long as either car is detained.

Interstate carriers would not be in violation either of section 1 or section 22, in according free transportation to a car occupied by the American National Red Cross Society and its attendants when traveling for the purpose of giving courses of instruction looking to the prevention of accidents in mines and factories and on railways, the car being used also for displaying approved safety appliances.

On a movement from a domestic point to a destination in Canada charges were assessed at a combination of rates both factors of which were on file with this commission but which made higher than another combination over the same route one factor of which was on file with the Canadian commission but not with this commission. Held, that the commission cannot award reparation on the latter combination.

A shipment having been accepted by the consignee at destination and removed to his place of business was subsequently returned to the delivering carrier, the outbound charges were refunded and included in the return waybill as advance charges. On delivery of the returned shipment to the original consignor the return charges as well as such advance charges were demanded and collected. Held, that the published rate for the return movement was the only charge that carrier could exact from the original consignor.

If when a concurrence is revoked the carrier that publishes the tariff neglects to make changes therein, shippers are entitled to have shipments moved as provided in the tariff, and the carrier that so neglects to correct its tariff

will be held responsible to other carriers for the difference in charges under the tariff as it is and as it would be if it had been corrected. If the tariff is published by a joint agent, the provisions herein will apply to each of his principals, as traffic is tendered to them as initial carriers.

A carrier for 25 years has operated a commissary car making two trips monthly with a staple line of meats, groceries and a restricted stock of shoes, overalls and other wearing apparel. The sales are limited to employees of the company and their immediate families and are not made for cash but on tickets signed by the company foreman showing the amount of wages due the holder. The purchases are limited to two-thirds of this amount. Held, that the practice is illegal and the operation of such a car is in violation of the commodity clause.

Where two or more carriers publish a joint through rate they must publish in connection therewith one carload minimum weight for the through movement under that rate. This ruling is not to be understood, however, as condemning the publication in joint tariffs and the use of through rates made up in combination on a specific base point and providing one minimum weight in connection with the specified portion of the rate up to the base point and a different minimum weight in connection with the specified portion of the rate beyond the base point.

A shipment had moved 150 miles from the point of origin before the consignor discovered that an error had been made in filling the consignee's order. On inquiry by telephone he was informed by the carrier's clerk that the car could be returned without extra charge, and thereupon the consignor requested its return for a correction of the loading. A part of the carload was exchanged, the shipment was again billed out and moved to destination. Held, that the commission cannot relieve the carrier from the obligation of collecting the published rates for all the movements actually made.

A carrier may issue a tariff publication under I. C. C. number containing an official list of its stations and showing distances, prepay stations, billing instructions to points not on the line of road, etc. If such publication contains no rates and no rules or regulations that of themselves or in connection with a tariff which refers to this publication affect the charges on any shipment, supplements to and reissues of it may be made effective on one day's notice to the public and to the commission. Each such supplement or reissue must bear on its title page notation: "Issued under authority of rule 10, tariff circular 17-A."

A shipment originating on one line and not routed by the shipper reached a junction point with another line where a joint agent was maintained. Instead of delivering the shipment to the other line at that point the joint agent permitted it to go forward on the originating line to another junction point with the second line, over which route the charges were substantially higher than if the second line had taken the shipment at its first junction with the originating carrier. Held, that although the agent was a joint agent, he was, with respect to this shipment acting as agent for the originating carrier and the cost of his error should be borne by that line alone.

While it has been the practice of the commission when examining the accounts of carriers to give notice in advance, this is done for the convenience of the commission and of the carriers and is not a requirement imposed upon the commission by the law. The credentials of an examiner are all that is necessary to entitle him to full access to the carrier's records, whether at its general offices or at a station, and the refusal to give access on the presentation of such credentials is in violation of the law. The commission, except in special cases, will continue to give previous notice of any such examination in writing, unless the refusal of the carriers to honor the credentials of examiners when presented without such notice shall make it necessary to withdraw the practice.

STATE COMMISSIONS.

The State Railroad Commission of Ohio has renewed its order permitting railways to suspend the demurrage tariff on carloads of fine coal. This concession in favor of this grade of coal has been in force nearly two years.

Ohio: Rate on Coal Reduced.

The Pittsburgh Vein Operators' Association of Ohio v. Wheeling & Lake Erie et al. Opinion by Commissioner Gothlin.

The complaint challenges the rate of 90 cents per ton f.o.b. vessel on coal, carloads, from mines in the No. 8 district of Ohio, to the village of Huron and the city of Cleveland, Ohio. The commission finds that the rate of 90 cents is excessive and that for the future 70 cents shall be substituted therefor.

Ohio: Loading Milk Cars.

The West Jefferson Creamery Co. v. Baltimore & Ohio Railroad. Opinion by Chairman Hughes.

Complaint is made that rates of the defendant are unreasonable and service inadequate in that defendant's tariff of rates on milk contains a rule that the shipper must load the milk into the car if required. Complaint is also made that defendant fails and refuses to publish and file rates on milk to Columbus, Ohio, from stations more than 75 miles distant, although receiving milk at such stations for other points within 75 miles.

The commission holds that loading and unloading less than carload freight must be considered as an incident of transportation, and that defendant's rule is unreasonable.

Where there is a regular station for receipt of freight, such freight must be received and transported to any other station on such line and connecting lines, regardless of distance.

COURT NEWS.

In the United States district court at Cincinnati, March 30, Judge Hollister, in cases against the Baltimore & Ohio Southwestern for violating the law forbidding shipment of unhealthy sheep, sustained the road in its contention that the words "received for shipment" meant the initial reception and not the receiving at the hands of another railway, as in the present case.

The Supreme Court of the United States will give a rehearing on the Baltimore & Ohio Southwestern suit involving the question as to whether the penalty for violation of the 28-hour law for the shipment of livestock shall be asssessed on the separate shipment, as urged by the government, or on the trainload as a unit, as contended by the road. By a vote of 4 to 4 the court affirmed the judgment of the lower court, which decided in favor of the government.

Holding that the action of the state of Arkansas in requiring railways to furnish cars for intrastate shipments within five days from the time they were ordered is a burden on interstate commerce, the Supreme Court has reversed the Supreme Court of Arkansas. The Supreme Court of Arkansas discussed the fact that the St. Louis Southwestern, in the case before the court, was unable to furnish more cars for local traffic because of the requirements of the American Railway Association applicable to cars going out of Arkansas. The Arkansas court said "it might be better for the appellant to suffer these ills than to sail under a black flag and refuse to send its cars beyond its line."

The Supreme Court of the United States has declared unconstitutional the law of Nebraska requiring railways to build tracks to all grain elevators along their lines on request. In announcing the opinion of the court in the Nebraska case, Justice Holmes said that, although the state possessed certain police powers, and that railways must fulfil the purposes for which their charters were granted, yet, he added, "railways, like other owners of property, have rights that are protected by the Constitution." He held that their property could not be taken without compensation, as this law proposed to do. The decision does not prejudice cases arising under the law as amended recently.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF FEBRUARY, 1910.

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenues (or deficit).	Outside operations. net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.					
Atchison, Topeka & Santa Fe	7,458	$4,519,189	$1,646,983	$6,643,192	$1,026,214	$1,057,318	$151,167	$2,162,087	$154,962	$4,551,748	$2,091,444	.....	$273,816	$1,817,628	—$324,488
Atlantic Coast Line	4,482	1,872,160	664,261	2,709,603	324,680	323,269	45,880	783,970	102,393	1,580,192	1,129,411	.....	95,500	1,033,911	143,963
Bangor & Aroostook	546	217,641	35,130	264,895	37,822	26,168	3,050	73,786	10,074	150,900	113,995	.....	1,500	112,495	22,241
Boston & Maine	2,242	1,849,119	871,279	2,943,840	276,306	450,090	35,637	1,520,842	79,765	2,362,640	581,200	$1,014	181,766	400,448	—129,587
Buffalo, Rochester & Pittsburgh	567	581,664	58,902	655,633	43,974	137,664	9,781	203,863	12,703	407,985	247,648	63	15,000	232,711	121,280
Central of Georgia	1,916	721,547	206,597	1,018,174	152,094	167,433	30,135	316,403	35,560	701,625	316,549	4,397	48,300	272,646	19,235
Chesapeake & Ohio	1,939	1,974,322	320,949	2,387,680	202,395	489,031	43,174	764,434	52,334	1,551,368	836,312	—2,661	80,500	753,151	208,698
Chicago & Eastern Illinois	966	825,698	137,148	1,009,119	99,252	200,483	24,898	403,227	31,867	759,727	249,392	—1,349	29,900	218,143	—7,462
Chicago & North Western	7,638	3,655,803	1,165,887	5,315,727	382,279	765,557	102,967	2,493,645	108,620	3,853,068	1,462,659	—8,058	228,000	1,226,601	171,387
Chicago, Burlington & Quincy	9,021	4,821,038	1,423,672	6,890,600	659,706	1,237,823	126,671	2,454,492	185,633	4,664,326	2,226,274	—17,146	215,571	1,993,557	289,547
Chicago Great Western R.R.	1,486*	720,016	165,520	945,080	135,014	103,899	42,981	479,940	37,916	799,750	154,330	—3,853	26,543	123,934	.....
Chicago, Rock Island & Pacific	7,393	3,082,889	1,198,359	4,585,746	731,056	642,045	147,876	2,047,326	143,559	3,711,862	873,884	—7,194	236,550	630,140	—237,935
Chic., St. Paul, Minn. & Omaha	1,739	776,585	281,886	1,133,085	71,365	145,362	22,562	504,101	27,710	771,100	361,985	—153	55,358	306,474	110,577
Cincinnati, Hamilton & Dayton	1,036	465,218	103,211	634,343	67,380	128,665	22,413	290,549	19,406	528,413	105,930	.....	26,899	79,031	69,471
Colorado & Southern	1,248	655,456	90,862	784,583	81,525	125,820	12,924	265,305	24,657	510,231	274,352	—1,709	21,925	250,718	84,296
Delaware, Lackawanna & Western	930†	1,958,908	434,212	2,556,961	169,689	412,738	57,084	783,234	54,292	1,477,037	1,079,924	18,847	118,650	980,121	212,125
El Paso & Southwestern Co.	867	439,493	92,413	562,973	93,109	90,660	9,573	156,559	22,147	372,048	190,925	—656	18,993	171,276	—78,253
Erie	1,961‡	2,543,887	533,671	3,362,431	323,366	616,059	95,398	1,292,862	72,391	2,400,076	962,355	—53,778	108,930	799,647	—103,198
Great Northern	7,129#	2,800,759	808,807	3,873,315	612,463	603,739	76,613	1,431,978	77,866	2,802,659	1,070,656	—2,382	286,902	781,372	10,395
Gulf, Colorado & Santa Fe	1,518	573,771	194,740	844,384	223,410	152,585	25,713	390,435	32,648	824,791	19,593	.....	35,758	—16,165	—260,437
Kansas City Southern	827	599,141	97,890	780,470	77,153	89,412	25,180	295,745	31,230	518,720	261,750	.....	29,164	232,586	—9,842
Lehigh Valley	1,441	2,113,736	244,804	2,443,285	266,289	402,905	64,116	864,527	57,304	1,655,141	788,144	—22,479	94,600	671,065	211,845
Louisville & Nashville	4,599§	3,058,513	805,510	4,115,839	734,054	686,682	93,453	1,347,964	100,346	2,962,499	1,153,340	33,237	125,580	1,060,997	71,256
Maine Central	932	443,515	147,527	627,894	77,254	106,386	5,824	246,618	19,349	455,431	172,463	1,289	35,993	137,759	6,476
Missouri, Kansas & Texas	3,072	1,207,034	569,751	1,921,341	328,339	234,947	55,632	868,486	79,059	1,566,463	354,878	—4,810	98,575	251,493	—74,362
Mobile & Ohio	1,114	593,727	91,440	810,560	100,813	145,812	30,039	287,980	34,852	599,496	211,064	—2,164	22,564	186,336	—51,655
New York, New Haven & Hartford	2,045	2,175,306	1,653,798	4,238,942	432,327	486,860	21,674	1,825,165	135,833	2,901,860	1,337,082	61,178	350,000	1,048,260	41,755
Norfolk & Western	1,941	2,303,864	249,945	2,657,233	258,583	476,916	47,081	825,168	57,391	1,665,139	992,094	—1,810	92,800	897,484	180,132
Pennsylvania R. R.	3,947	9,236,557	2,167,388	12,149,287	1,554,650	2,582,485	154,186	4,575,382	314,067	9,180,770	2,968,517	—163,172	197,526	2,607,819	829,708
Pennsylvania Co.	1,416	2,953,562	487,090	3,767,355	629,493	712,000	80,426	1,387,700	74,426	2,884,045	883,310	—5,106	145,226	732,978	356,464
Pere Marquette	2,331	867,544	211,955	1,161,369	132,517	157,626	38,026	552,265	30,477	910,911	250,458	3,415	69,060	184,813	60,323
Philadelphia, Baltimore & Washington	717	605,397	541,362	1,280,644	234,161	253,294	30,056	564,796	31,774	1,114,081	166,563	.....	35,772	130,791	—7,900
Pitts., Cincinnati, Chicago & St. Louis	1,468	2,263,369	487,433	3,093,952	455,736	588,965	77,256	1,148,864	57,105	2,327,926	766,026	—876	112,939	652,211	147,950
Southern Ry.	7,050	3,042,690	998,727	4,417,369	508,180	772,336	120,596	1,558,297	145,618	3,105,027	1,312,342	—2,917	170,100	1,139,325	228
Union Pacific	3,411¶	2,633,327	712,102	3,690,131	272,555	518,152	88,224	1,107,457	85,400	2,071,789	1,618,342	—19,083	123,250	1,476,009	343,304
Vandalia	827	502,747	144,088	736,499	93,616	155,428	24,127	304,720	18,465	596,355	140,144	.....	25,199	114,944	—10,153
EIGHT MONTHS OF FISCAL YEAR 1910.															
Atchison, Topeka & Santa Fe	7,458	38,375,570	13,771,533	56,566,845	9,325,603	8,605,090	1,134,708	16,239,950	1,219,865	36,525,216	20,041,629	.....	2,132,874	17,908,755	—411,055
Atlantic Coast Line	4,482	13,415,595	4,453,838	19,249,961	2,623,819	2,751,452	327,592	5,863,220	542,609	12,108,692	7,141,269	.....	758,500	6,382,769	1,293,815
Bangor & Aroostook	546	1,378,774	439,808	1,916,941	295,873	222,746	22,834	537,256	83,387	1,162,096	754,845	.....	12,000	742,845	113,723
Boston & Maine	2,242	16,848,998	9,971,269	28,919,509	3,525,022	3,502,125	332,056	12,408,388	645,121	20,412,712	8,506,797	54,053	1,398,644	7,162,206	772,437
Buffalo, Rochester & Pittsburgh	567	5,077,520	665,375	6,016,268	626,310	1,236,418	73,329	1,645,706	104,797	3,686,560	2,329,708	702	106,000	2,224,410	955,457
Central of Georgia	1,916	5,497,107	2,073,157	8,288,960	1,164,982	1,267,700	239,953	2,432,712	317,304	5,422,651	2,866,309	47,423	386,557	2,527,175	359,646
Chesapeake & Ohio	1,939	16,445,241	3,327,986	20,584,247	2,109,789	3,886,605	352,096	5,553,395	388,698	12,290,583	8,293,664	—8,462	553,000	7,732,202	1,654,022
Chicago & Eastern Illinois	966	6,422,185	1,246,956	8,069,508	753,013	1,500,039	178,078	2,740,791	259,523	5,431,444	2,638,064	—11,045	242,524	2,384,495	493,071
Chicago & North Western	7,638	32,983,322	12,524,581	49,453,944	7,461,229	6,298,702	937,149	19,478,356	823,918	34,999,354	14,454,590	—35,732	1,824,000	12,594,858	—1,804,979
Chicago, Burlington & Quincy	9,021	39,134,208	15,256,890	59,237,020	9,920,185	10,359,066	1,125,992	18,524,495	1,447,479	41,387,217	17,849,803	—119,712	1,724,688	16,005,402	—423,204
Chicago Great Western R.R.	1,486*	4,189,719	1,259,271	5,880,519	664,137	684,246	246,403	2,578,852	203,095	4,376,733	1,503,786	—10,354	162,362	1,331,070	.....
Chicago, Rock Island & Pacific	7,393	26,832,234	12,689,527	41,996,898	6,798,093	5,419,038	1,039,014	15,544,503	1,141,465	29,942,113	12,054,785	—104,045	1,696,727	10,254,013	336,685
Chic., St. Paul, Minn. & Omaha	1,739	6,369,344	2,977,227	10,049,513	1,236,163	1,167,414	191,029	3,747,690	222,466	6,564,762	3,484,751	—327	428,763	3,055,661	116,668
Cincinnati, Hamilton & Dayton	1,036	4,474,156	1,160,647	6,299,866	811,974	1,080,065	174,147	2,496,396	209,499	4,772,081	1,527,785	.....	208,788	1,318,997	467,098
Colorado & Southern	1,248	5,081,693	1,131,983	6,541,672	832,075	1,031,162	111,502	2,066,235	169,743	4,210,717	2,330,955	—4,075	173,300	2,153,580	296,235
Delaware, Lackawanna & Western	930†	17,740,454	4,683,181	23,874,126	2,009,230	3,190,548	424,960	6,449,903	453,607	12,528,248	11,345,878	207,567	1,041,400	10,512,045	1,090,280
El Paso & Southwestern Co.	867	3,818,750	696,438	4,736,992	675,435	634,149	82,619	1,290,143	180,751	2,863,097	1,873,895	—7,070	162,531	1,704,293	—78,348
Erie	1,961‡	22,946,144	5,799,452	31,051,523	3,484,343	5,531,124	721,801	10,176,220	636,249	20,549,737	10,501,786	—168,299	848,926	9,484,561	1,361,047
Great Northern	7,129#	31,013,323	9,547,662	42,834,666	6,423,703	4,881,798	593,061	11,828,283	656,942	24,383,787	18,450,879	240,073	2,401,404	16,289,548	2,990,229
Gulf, Colorado & Santa Fe	1,518	5,751,427	2,036,994	8,311,193	1,668,607	1,253,169	192,661	3,105,605	243,550	6,463,592	1,847,601	.....	276,475	1,571,126	—1,004,096
Kansas City Southern	827	4,600,941	938,634	6,166,389	685,557	799,570	205,856	2,102,493	240,258	4,033,734	2,132,655	.....	210,908	1,921,747	—96,738
Lehigh Valley	1,441	19,663,235	2,879,520	23,381,148	2,449,437	3,873,260	590,100	6,964,839	472,474	14,350,110	9,031,038	—7,420	756,800	8,266,818	1,344,393
Louisville & Nashville	4,599§	25,177,665	7,207,781	34,486,458	4,340,248	5,404,581	725,816	10,346,747	690,559	21,507,951	12,978,507	—14,097	1,005,890	11,958,520	2,200,350
Maine Central	932	3,549,476	2,023,050	5,928,798	865,572	835,760	60,412	1,988,707	176,297	3,926,748	2,002,050	23,036	285,389	1,739,697	304,680
Missouri, Kansas & Texas	3,072	11,903,198	5,207,404	18,193,765	2,579,658	2,238,049	431,686	6,555,823	589,324	12,394,540	5,799,225	—18,465	725,862	5,054,898	549,666
Mobile & Ohio	1,114	5,088,978	871,429	6,926,555	822,405	1,237,572	239,051	2,256,398	252,187	4,807,613	2,118,942	—19,330	177,666	1,921,946	—69,108
New York, New Haven & Hartford	2,045	19,591,251	16,657,342	39,823,940	4,337,955	4,370,712	202,643	15,095,430	1,003,557	25,010,297	14,813,643	884,759	2,605,000	13,093,402	3,441,104
Norfolk & Western	1,941	19,366,586	2,660,690	22,769,641	2,279,705	3,865,062	353,281	6,527,765	465,694	13,491,506	9,278,135	—10,419	689,600	8,578,116	1,678,176
Pennsylvania R. R.	3,947	78,879,169	20,756,907	106,469,379	12,890,591	19,612,715	1,343,509	35,274,886	2,455,354	71,577,055	34,892,324	—812,239	1,580,209	32,499,876	6,894,801
Pennsylvania Co.	1,416	27,719,031	5,085,960	35,510,067	4,470,727	5,582,517	558,888	11,149,186	595,929	22,357,247	13,152,820	—24,908	1,185,764	11,942,148	3,361,746
Pere Marquette	2,331	7,238,866	2,572,655	10,574,807	1,331,744	1,375,374	269,411	4,192,443	237,930	7,406,902	3,167,905	11,242	417,335	2,761,812	505,130
Philadelphia, Baltimore & Washington	717	5,855,923	4,715,238	11,755,304	1,696,122	2,019,739	192,303	4,601,184	250,079	8,759,427	2,995,877	.....	286,173	2,709,704	351,242
Pitts., Cincinnati, Chicago & St. Louis	1,468	18,430,769	5,065,213	26,315,478	3,545,727	4,435,452	544,263	8,616,310	474,203	17,615,955	8,699,523	—6,911	887,139	7,805,473	1,812,853
Southern Ry.	7,050	25,256,087	9,969,815	38,181,880	4,499,673	6,393,877	917,380	12,524,492	1,147,907	25,483,329	12,698,551	11,822	1,318,002	11,392,371	1,231,058
Union Pacific	3,411¶	25,360,165	7,462,447	35,784,513	3,303,659	3,747,862	901,077	8,618,950	768,902	17,340,450	18,444,063	—23,221	1,051,526	17,369,315	1,679,583
Vandalia	827	4,374,675	1,501,674	6,562,630	921,460	1,150,398	192,316	2,358,372	149,552	4,772,098	1,790,532	.....	192,875	1,597,657	286,854

* Began operations on September 1, 1909. †Mileage operated on February 28, 1909, 893 miles. ‡ Mileage operated on February 28, 1909, 1,901 miles. § Mileage operated on February 28, 1909, 4,388 miles. # Mileage operated on February 28, 1909, 6,937 miles. ¶ Mileage operated on February 28, 1909, 3,309 miles. — Indicates Deficits, Losses and Decreases.

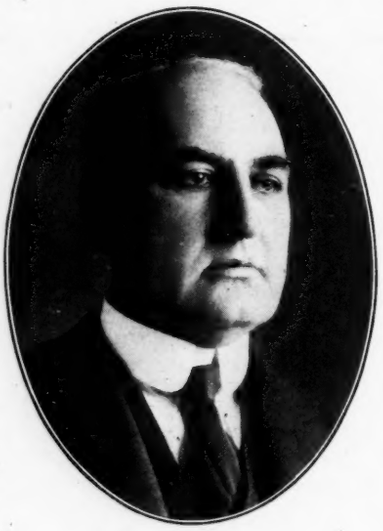
Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

W. H. Wilson, superintendent of motive power of the Buffalo, Rochester & Pittsburgh at Du Bois, Pa., has been appointed assistant to the third vice-president of the Northern Pacific, with office at St. Paul, Minn.

F. C. Batchelder, the new vice-president and general manager of the Baltimore & Ohio Chicago Terminal Co., at Chicago, was born at Fall River, Wis., on May 27, 1857. He began railway work in 1874 as a telegraph operator and station agent on the Chicago, Milwaukee & St. Paul, filling various positions with that company and the Minneapolis, St. Paul & Sault Ste. Marie, until February, 1899, when he was made superintendent of the Soo. In July, 1899, he went to the Baltimore & Ohio as superintendent of the Chicago division, with office at Garrett, Ind., and was transferred on December 1, 1901, to Newark, Ohio, as superintendent of the Newark division. He returned to the Chicago division on April 1, 1905, as superintendent, with office at Chicago. In December, 1906, he succeeded C. C. F. Bent, now general manager of the Baltimore & Ohio Southwestern, as general superintendent of the main line of the B. & O. at Baltimore, Md., and on April 1, 1910, when the Baltimore & Ohio took over the operation of the Chicago Terminal Transfer Railway, under the name of the Baltimore & Ohio Chicago Terminal Co., Mr. Batchelder was elected vice-president and general manager of the new company. A re-arrangement of the operating organization of the Baltimore & Ohio lines west of Chicago Junction, Ohio, was made, with the creation of the Northwest system, which is also under the jurisdiction of Mr. Batchelder, as general superintendent.



F. C. Batchelder.

M. L. Bell, assistant general attorney of the Rock Island Lines at Chicago, has been appointed general attorney, with office at Chicago, succeeding E. C. Lindley, resigned to become general solicitor of the Great Northern, with office at St. Paul, Minn.

Newman Erb has been elected to the new position of chairman of the board of the Ann Arbor Railroad. H. H. Harrison has been elected vice-president and treasurer, succeeding B. J. Burke as vice-president, and G. Casper Niles as treasurer, and H. B. Blanchard succeeds Mr. Niles as secretary, all with offices at New York.

Operating Officers.

P. L. McManus has been appointed trainmaster on the Chicago & Alton, with office at Springfield, Ill., succeeding F. M. Corbett, transferred.

A. E. Kane has been appointed an assistant superintendent on the Salt Lake division of the Southern Pacific lines east of Sparks, with office at Sparks, Nev.

Thomas Brennan, assistant superintendent of the Chicago, Indiana & Southern at Gibson, Ind., has been transferred to Danville, Ill., as trainmaster, succeeding W. L. Connelly, promoted.

The following officers of the St. Louis Southwestern have been appointed assistant superintendents: F. S. Stimson, trainmaster at Illmo, Mo.; E. Richards, trainmaster at Pine Bluff, Ark.; C. S. Hutchins, trainmaster at Mt. Pleasant, Tex., and H. D. Earl, trainmaster at Tyler, Tex.

H. T. Coates, Jr., foreman of the Enola, Pa., shops of the Pennsylvania Railroad, has been promoted to a position on the staff of W. H. Myers, general manager, with office at Philadelphia.

W. E. Baily, trainmaster of the Lehigh & New England at Pen Argyl, Pa., will in future have jurisdiction over the entire road. The office of J. J. Kitchin, trainmaster at Sussex, N. J., has been abolished.

J. A. Logan has been appointed acting superintendent of transportation of the Missouri, Kansas & Texas, with office at Denison, Tex., succeeding T. S. McDowell, granted a leave of absence on account of ill health.

W. W. Brogan, trainmaster of the Gulf & Ship Island at Hattiesburg, Miss., has been appointed acting superintendent, succeeding George F. Gardner, general superintendent, deceased. Mr. Brogan will report to the second vice-president.

D. H. Lovell has resumed his duties as superintendent of the West Jersey & Sea Shore and general superintendent of the Philadelphia & Camden Ferry Co., with office at Camden, N. J., succeeding J. T. Wallis, temporarily filling these positions, who returns to the motive power department.

John J. Driscoll, superintendent of the Connellsville division of the Baltimore & Ohio, at Connellsville, Pa., has been transferred to the Cumberland division, succeeding F. E. Blaser, promoted. C. L. French, trainmaster of the Cumberland division at Cumberland, Md., succeeds Mr. Driscoll, with office at Connellsville.

O. J. Langston has been appointed an assistant superintendent of the Oregon Short Line at Kemmerer, Wyo., succeeding L. E. Halbert, assigned to other duties. Frank E. Eisenhard has been appointed an assistant superintendent, with office at Pocatello, Idaho, succeeding T. C. Collopy, granted leave of absence.

J. H. Stephens, chief despatcher of the Union Pacific at Omaha, Neb., has been appointed assistant superintendent, with office at Omaha, succeeding W. R. Cahill, promoted. C. C. Cornell, assistant superintendent at Grand Island, Neb., has been appointed assistant superintendent at Omaha, in charge of terminals. Frank D. Schermerhorn, supervisor of bridges and buildings at Omaha, Neb., succeeds Mr. Cornell, is under the charge of Professor Howard G. Brounson.

Frederick E. Blaser, who has been promoted from superintendent of the Cumberland division of the Baltimore & Ohio to general superintendent of the main line, with office at Baltimore, Md., was born at Tomah, Wis., and educated in the public schools at that place. Mr. Blaser began the study of telegraphy when he was nine years of age, and began railway work in April, 1871, as a waterboy in the construction department of the West Wisconsin Railroad, now a part of the Chicago, St. Paul, Minneapolis & Omaha. After completing the study of telegraphy he was consecutively operator and agent, freight brakeman and conductor, train despatcher, passenger conductor and trainmaster, until June, 1900, when he went to the Ohio River Railroad. The following month he was appointed superintendent of that road and remained in the same position when it was taken over by the Baltimore & Ohio system on August 1, 1901. He was transferred

F. E. Blaser.

to the Wheeling division as superintendent April 16, 1903, and the following February was transferred to the Cumberland division, which position he held at the time of his recent appointment.

A. H. Westfall, whose appointment as general superintendent of the Chicago & Alton and the Toledo, St. Louis & Western, with office at Bloomington, Ill., has been announced in these columns, was born June 14, 1862, at Milwaukee, Wis. He was educated in the public schools and at the German and English Academy at Milwaukee, and began railway work in 1880 as an agent and operator on the Chicago, Milwaukee & St. Paul. In 1884 he was made train despatcher, and three years later went with the Elgin, Joliet & Eastern as chief train despatcher. For four years from 1897 he was assistant superintendent of the Chicago, Lake Shore & Eastern, and he was then made general superintendent of that road and the E. J. & E. In 1906 he was appointed superintendent on the Atlanta division of the Southern Railway, and the next year was promoted to general superintendent on the Northern division, which position he resigned to accept his present appointment.

A. H. Westfall.

Traffic Officers.

R. F. Malone, assistant general passenger agent of the Chicago Great Western, with office at Chicago, has resigned.

G. A. Dobbin, industrial and colonization agent of the Gulf, Colorado & Santa Fe at Houston, Tex., has had his office transferred to Galveston, Tex.

G. W. Quackenbush, assistant general freight agent of the Chicago & Alton, with office at Springfield, Ill., has resigned to accept a position with the Illinois Traction Company.

A. J. Hirshman has been appointed a traveling freight agent of the Missouri, Kansas & Texas of Texas, with office at Fort Worth, Tex., succeeding D. Allen, resigned to accept service with the Morgan Steamship line.

G. M. Ellis, chief clerk in the office of the assistant general passenger agent of the Southern Railway at Chattanooga, Tenn., has been appointed division passenger agent at Knoxville, succeeding J. E. Shipley, resigned, effective April 15.

L. M. Foss, division freight agent of the Chicago Great Western at Red Wing, Minn., has been appointed division freight agent, with office at Fort Dodge, Iowa, succeeding C. B. Fiske, resigned to engage in other business. B. J. De Groodt, commercial agent at Des Moines, Iowa, succeeds Mr. Foss.

C. V. Manker, soliciting agent of the Southern Railway at St. Louis, Mo., has been transferred to East St. Louis, Ill. J. T. Powers succeeds Mr. Manker, with office at St. Louis, Mo. E. J. Burke has been appointed traveling tariff inspector of the St. Louis-Louisville lines, with office at Louisville, Ky., succeeding J. S. Rhamstine, deceased.

F. R. Dalzell has been appointed division freight agent of the Gulf, Colorado & Santa Fe, with office at Dallas, Tex., succeeding J. N. Griswold, resigned to accept service elsewhere. T. V. Murray, Jr., soliciting freight agent of the Missouri Pacific-Iron Mountain system at Dallas, has been appointed soliciting freight agent on the Santa Fe, succeeding T. C. Taylor, resigned to accept service elsewhere. Mr. Murray will report to the division freight agent.

T. O. Jennings, general agent in the freight department of the Chicago & Eastern Illinois at Chicago, has been appointed assistant general freight agent, with office at Chicago, succeeding E. J. Knickerbocker, resigned to engage in other business. B. H. Stanage, chief clerk in the freight department, has been appointed an assistant general freight agent in charge of claims, with office at Chicago. E. S. Stephens, freight claim agent at Chicago, succeeds Mr. Jennings.

James Young, contracting freight agent of the Great Northern at Chicago, has resigned to engage in other business. F. T. Lonergan, traveling freight agent at Chicago for the Indiana district, has been transferred to the Illinois district, with office at Chicago, succeeding George B. Ogden, transferred to Buffalo, N. Y. Robert C. Huston succeeds Mr. Lonergan in the Indiana district. R. W. Richards and Francis Frawley have been appointed contracting agents, with office at Chicago.

Thomas E. Watt, district passenger agent of the Pittsburgh district of the Pennsylvania Railroad at Pittsburgh, Pa., having reached the age limit, has been retired, after 49 years of continuous service in the employ of the Pennsylvania Railroad. Mr. Watt entered the service of the Pennsylvania on May 1, 1860, as a brakeman on passenger trains, and in 1864 was promoted to passenger conductor. He was made city ticket agent in 1872 at Pittsburgh, Pa., and five years later was appointed district passenger agent.

Walter Shelton Saunders, who has been appointed assistant general freight agent of the Virginian Railway, with office at Norfolk, Va., as announced in these columns, was born August 3, 1870, at Richmond, Va. He was educated in the public schools at Richmond and began railway work in 1888 with the Chesapeake & Ohio at Richmond. He was with that company as billing clerk in the freight office until March, 1900, when he went to Roanoke, in the general freight office of the Norfolk & Western. In May, 1896, he was made chief clerk of all rail despatch lines, operating over the Norfolk & Western under O. Howard Royer, manager, and in June, 1905, he became chief clerk to the assistant general freight agent of the Norfolk & Western. He went to the Virginian Railway in June, 1909, as chief clerk to the general freight agent at Norfolk, remaining in that position until his recent appointment as assistant general freight agent.

Engineering and Rolling Stock Officers.

Bernard Herman has been appointed principal assistant engineer of the Southern Railway, with office at Washington, D. C.

Robert Rice has been appointed roadmaster of the Kansas Southwestern, with office at Portland, Kan., succeeding Thomas Fleming, deceased.

James Duffy, a foreman on the Chicago Junction Railway, has been appointed roadmaster of the Chicago & Illinois Western, with office at Chicago.

W. L. Harrison, superintendent of motive power of the Northern district, Rock Island Lines, at Cedar Rapids, Iowa, has resigned to go into other business.

R. A. Pyne, district master mechanic of the Canadian Pacific at Nelson, B. C., has been appointed master mechanic, with office at Calgary, Alta., succeeding W. E. Woodhouse, promoted.

W. G. Himes, assistant engineer of the Lehigh & New England, at Bethlehem, Pa., has been appointed engineer maintenance-of-way, with office at Bethlehem, and his former position has been abolished.

F. J. Harrison, division master mechanic of the Buffalo, Rochester & Pittsburgh, has been appointed superintendent of motive power, with office at Du Bois, Pa., succeeding W. H. Wilson, resigned to go to another company.

W. J. Rusling, assistant master mechanic of the Pennsylvania Railroad, at Harrisburg, Pa., has been appointed foreman of the Enola, Pa., shops, succeeding H. T. Coates, Jr., promoted. H. G. Huber, assistant master mechanic at Phillipston, succeeds Mr. Rusling.

J. M. Borrowdale, assistant superintendent of the car department of the Illinois Central, has been appointed superintendent of the car department of that road, the Indianapolis

Southern and the Yazoo & Mississippi Valley. Robert W. Bell, superintendent of machinery; Mr. Borrowdale and Edward J. Jansen, who has been appointed electrical engineer, will report to the general superintendent of motive power.

J. T. Wallis, acting superintendent of the West Jersey & Sea Shore, and acting general superintendent of the Philadelphia & Camden Ferry Co., has resumed his duties as superintendent of motive power of the Erie division of the Pennsylvania Railroad and the Northern Central, with office at Williamsport, Pa.

F. W. Williams, superintendent of motive power of the Southern district of the Rock Island Lines at Fort Worth, Tex., has been transferred to the Northern district, with office at Cedar Rapids, Iowa, succeeding W. L. Harrison, resigned to engage in other business. C. M. Taylor, superintendent of motive power at Shawnee, Okla., has had his jurisdiction extended over the entire Southern district. T. W. McCarthy, master mechanic of the Arkansas division at Little Rock, Ark., has been appointed master mechanic of the Indiana Territory and the Pan Handle divisions, with office at Shawnee, Okla. C. A. McCarthy, master mechanic of the Louisiana division at Eldorado, Ark., succeeds T. W. McCarthy, with office at Argenta, Ark., and W. J. O'Neill, master mechanic at Fort Worth, Tex., succeeds C. A. McCarthy.

Morgan K. Barnum, general inspector of machinery and equipment of the Chicago, Burlington & Quincy, has been appointed general superintendent of motive power of the Illinois Central, the Indianapolis Southern and the Yazoo & Mississippi Valley, with office at Chicago. Mr. Barnum was born April 6, 1861. He graduated from Syracuse University in 1884 with the degree of A.B. and later received the degree of A.M. He began railway work the year he graduated as a special apprentice in the shops of the New York, Lake Erie & Western, now the Erie, at Susquehanna, Pa. He was then consecutively machinist and mechanical inspector and later general foreman of the same road at Salamanca, N. Y.; general foreman of the Louisville & Nashville shops at New Decatur, Ala.; assistant master mechanic of the Atchison, Topeka & Santa Fe at Argentine, Kan.; superintendent of shops at Cheyenne, Wyo.; district foreman at North Platte, Neb., and then division master mechanic at Omaha, Neb., on the Union Pacific; assistant mechanical superintendent on the Southern Railway. In February, 1903, he was made superintendent of motive power of the Chicago, Rock Island & Pacific, and in April of the next year was made mechanical expert of the Chicago, Burlington & Quincy; since 1907 has been general inspector of machinery and equipment of the Burlington.

M. K. Barnum.

Purchasing Officers.

J. J. Conn has been appointed assistant general purchasing agent of the Atchison, Topeka & Santa Fe, with office in Chicago.

William Wibel, acting assistant purchasing agent of the National Railways of Mexico, the Mexican International and the Interoceanic, at New York City, has been appointed assistant purchasing agent of these companies, with office at New York.

Addison B. Lacy, who has been appointed purchasing agent of the Virginian Railway, with office at Norfolk, Va., was born on March 25, 1875, at Gloucester City, N. J. He was educated in the common schools of Philadelphia, Pa., and began railway work on January 1, 1892, with the Norfolk & Western, remaining with that company till December, 1898, as messenger and clerk in the purchasing agent's office at Philadelphia and at Roanoke, Va. In December, 1898, he left railway work to become assistant buyer and later buyer for a railway supply house in New York City. He returned to railway work in December, 1901, as chief clerk to the purchasing agent of the Seaboard Air Line at Portsmouth, Va., and from November, 1905, was chief clerk in the purchasing department under the assistant general manager of the Virginian Railway, which position he held at the time of his recent appointment as purchasing agent.

OBITUARY.

D. B. Eldredge, traveling freight and passenger agent of the Rock Island Lines at Salt Lake City, Utah, died at Salt Lake City on April 2.

Caleb Wheeler Durham, civil engineer, died March 28, 1910, at Peekskill, N. Y., at the age of 63 years. He was born February 6, 1848, at Tunkhannock, Pa., and served in the Civil war as a private in 1863 and 1864. He subsequently studied at the University of Michigan, in the class of '69, and commenced railway work as an assistant engineer on the New York Central Railroad, now the New York Central & Hudson River. In 1871 he was engineer in charge of construction of a section of the Chicago & North Western and the following year was appointed principal assistant engineer on the location of the Texas & Pacific in Arizona and New Mexico. Subsequently he was in general practice in Chicago as engineer and surveyor. He invented an improved hot air furnace embodying the principles now recognized as essential in the best types of furnace, and a system of hot air heating and ventilation, and in 1880 invented and afterward carried on business of installation of the Durham system of house drainage, consisting of wrought iron or steel pipe with special threaded fittings, now almost universally employed in large buildings. On the recommendation of Col. Waring he installed the entire drainage system in the Capitol at Washington, D. C. He married, May 28, 1873, Clarissa Safford Welles, of Ann Arbor, Mich., who died in 1907, and is survived by four sons. Mr. Durham was a member of the Chi Psi fraternity, one of the early members of the Civil Engineers' Club of the Northwest, and a charter member of the Engineers' Club of New York. For 19 years he was a member of the American Society of Civil Engineers.

Henry H. Porter, railway manager and builder and recently president of the Chicago Transfer & Clearing Company, died in Chicago on March 31. Mr. Porter was born December 7, 1835, at Machias, Me. He attended the public schools and East Machias Academy, and in 1853 began railway work as a station agent on the Galena & Chicago Union, now a part of the Chicago & North Western. He was later paymaster and general ticket agent on that road, and then general freight agent and general superintendent of the Michigan & Northern Indiana. He was at one time general manager of the Chicago & North Western and from 1874 to 1877 organized and consolidated the various roads now comprised in the Chicago, St. Paul, Minneapolis & Omaha, of which road he was president for several years. He was also at one time president of the Chicago & Indiana Coal Railroad and of its successor, the Chicago & Eastern Illinois, and was for a time chairman of the board of the latter road. He was also chairman of the board of the Duluth & Iron Range. He was a director of the Chicago, Rock Island & Pacific for a number of years from 1869, of the Chicago & North Western from 1870 to 1878, and of the Union Pacific from 1873 to 1877. Mr. Porter was also interested in the formation of the Illinois Steel Company and later in the Federal Steel Company and in the development of iron ore properties and in lumbering in Michigan and Wisconsin. He was one of the organizers of the Chicago Shipbuilding Company and of its successor, the American Shipbuilding Company. He was interested in the laying out of the present Chicago stock yards, and the Chicago Transfer & Clearing Company, of which he was president at the time of his death, was organized by him.

Railway Construction.

New Incorporations, Surveys, Etc.

ALBERTA & GREAT WATERWAYS.—This company will start work soon, it is said, from Edmonton, Alb., south to Calgary, about 200 miles. It is intended to ultimately extend the line further south. Darling & Lumsden, engineers, are working on the plans. E. A. James, manager, Edmonton. W. R. Clark, Kansas City, Mo., is also interested. (Oct. 1, p. 612; Nov. 26, p. 1036.)

ARBUCKLE & WESTERN.—An officer writes that the company was recently incorporated with $400,000 capital, which will be increased to about $5,000,000. The plans call for a line from Ardmore, Okla., northwest to Chickasha, 110 miles, with a branch from Milo west to Lawton, 80 miles. The company is about ready to let contracts and expects to begin the work soon. There will be about 17 steel or concrete bridges, none of which will be over 100 ft. long, and probably one important trestle. Oscar O. Ayres, president and acting chief engineer, Ardmore. (April 1, p. 917.)

ARIZONA SOUTHERN.—The Arizona-Mexican Construction Co. has been incorporated in Arizona, with a capital of $100,000, by M. Goodloc, O. Longacre, Jr., D. J. Holdrige, L. M. Mulhern and A. W. Davis. It is understood that the company was formed to build an extension of the Arizona Southern, now in operation from Silverbell, Ariz., northeast to Red Rock, 20 miles, from the present southern terminus at Silverbell southwest towards Port Lobos, Mexico, on the Gulf of California. It is probable that an extension will also be built from Red Rock north to the Christmas-Winkelman section.

ASTORIA, SEASIDE & TILLAMOOK.—F. L. Smart, vice-president of the National Public Utilities Corporation, promoters of this project, and W. L. Crisman, Portland, Ore., are quoted as saying that the necessary right-of-way has been secured and actual construction work is to be started before April 1. The company's plans provide for a direct rail connection from Portland to Tillamook. The line will be 70 miles long and, it is estimated, will cost $2,000,000 to build.

BUTTE & BOISE.—An officer writes that as soon as preliminaries have been arranged for work will be started on this line. The company was organized in Idaho and has preliminary survey and location made. Capital has been secured to carry out the work. The projected route is from Butte, Mont., southwest to the Big Hole basin, thence following the Big Hole river and via the summit of the mountains to Salmon, Idaho, and along the Salmon river to the Sawtooth range, thence to Boise down the Boise valley via Caldwell to the Snake river and through Jordan valley to Winnemucca, Nev. At Butte connections will be made with the Northern Pacific, the Chicago, Milwaukee & Puget Sound and the Great Northern, and at Winnemucca with the Western Pacific and the Southern Pacific. S. H. Bracey, president; G. T. Wiswell, chief engineer, 1606 Tribune building, Chicago.

CALIFORNIA ROADS.—According to press reports from Red Bluff, Cal., a line is projected from Red Bluff northwest via Camp Wrigley, on Tom Head mountain, in the western part of Tehama county, to Eureka, about 110 miles. The line is to be built to provide an outlet for the copper mines at Camp Wrigley. The project is backed by Chicago and New England capitalists and has no connection with the proposed electric line from Eureka via Hayfork and Harrison Gulch. William Wrigley, Jr., Chicago, is said to be interested. N. E. Guyot, Chamber of Commerce, Tehama county, can give information.

CANADIAN NORTHERN.—Contracts are to be let at once for the following work: Extension of the Oak Point line from Oak Point, Man., north; extension from Battleford, Sask.; extension of the Edmonton & Slave Lave from Morinville, Alb., north.

The company now has under consideration the question of building the main line west of Edmonton, Alb., but nothing definite has yet been decided. (April 1, p. 917.)

CANADIAN PACIFIC.—Plans are said to have been filed for extensions to complete a line between Regina, Sask., and Prince Albert, 129 miles. Bids are to be asked for the work at once.

The following contracts are said to be let: In Alberta, for an extension of the Kipp line, to Foley, Welch & Stewart, from the present terminus at Little Bow river northwest. The plans include an extension from Carmangay to a point southeast of Calgary, and next year it is intended to continue the extension to a connection with the Calgary-McLeod branch. (March 4, p. 460.)

Branch from Langdon line at Irricanna, Alb., southeast, let to Foley, Welch & Stewart.

Contract for 25-mile section of the Weyburn extension let to the J. D. McArthur Co., Winnipeg, Man., and 90 miles of the Outlook extension will also be built by the J. D. McArthur Co. John Bradley, Brandon, Man., is said to have a contract for work from Craven, Sask., north to Colonsay, 110 miles. (March 4, p. 460.)

Right-of-way secured and work to be started soon on an extension of the Esquimault & Nanaimo from Union Bay, B. C., to Oyster river, about 25 miles, into the Comax district.

According to press reports plans are under consideration by the Canadian Pacific for large improvements to be made in Montreal, Que. These include a large addition to the yards in the east end; additional trackage from Dalhousie square to Hochelaga; the construction of a continuous series of subways under Notre Dame street, which is to become a continuous viaduct from Berri street to Sohmer park; the rearrangement and partial reconstruction of the station buildings, and the construction of new freight sheds and warehouses near Dalhousie square. From the point where the warehouses are to be built the company owns land to the harbor front.

CHERRYVALE, OKLAHOMA & TEXAS.—According to press reports from Caney, Kan., construction work has been started by this company. The company plans to build a line from Cherryvale, Kan., southwest towards El Paso, Tex., with a branch south towards Aransas Pass, and another branch south to South McAlester, Okla., also one from Caney southeast towards Fayetteville, Ark. B. J. Dalton, chief engineer, Lawrence, Kan. (March 25, p. 849.)

CHICAGO & ILLINOIS WESTERN.—The yards and second track between McCook, Ill., and Hodgkins are to be extended. An automatic track scale will be installed at McCook, where a hump yard is under construction.

CHICAGO & NORTH WESTERN.—An officer is quoted as saying that work on an extension from Milwaukee, Wis., northwest to Elroy, 130 miles, will probably be started about May 1. The new line will run over a more level country than the present route via Madison. Other extensions include a line from Belle Fourche, S. Dak., northeast to the Moreau river, about 40 miles; Pierre, S. Dak., north to Gettysburg, about 40 miles, and a line from Iroquois, west to this proposed extension, about 112 miles. (Nov. 26, p. 1036.)

CINCINNATI, HAMILTON & DAYTON.—A contract is said to have been given to the Carter Construction Co., Chicago, for revision work between Piqua junction, Ohio, and Swanders, on about 10.5 miles.

DELAWARE, LACKAWANNA & WESTERN.—The report of this company for the year ended December 31, 1909, shows that there was laid during the year 19,370 tons of new open hearth rails, with fastenings, which was 5,998 tons more than during 1908. A large amount of stone ballasting work has been carried out during the year, about 202,537 cu. yds. of stone having been used, which ballasted 40.75 miles of double-track. This work will be prosecuted more vigorously during the coming year. Contracts have been made for an increased quantity of pressed stone for this purpose, the intention being to complete the work of stone ballasting the main track between Hoboken, N. J., and Buffalo, N. Y., as soon as possible. Important work of a permanent character was done on the docks and wharves at Hoboken during the year and similar work will be carried out during the coming year. The Lackawanna Railroad Co. of New Jersey, which was organized in New Jersey in 1908 to build a cut-off between Slateford, Pa., and Port Morris, N. J., 28 miles, has been pushed vigorously dur-

ing the year. It is expected that it will be completed and ready for operation by the latter part of 1911. The work is heavy and expensive, the line being located in a semi-mountainous section. The total cost will be between $8,000,000 and $9,000,000. The new line will be about 11.5 miles shorter than the existing line, and will have lower grades and less curvature. During 1909 the company advanced for construction of this line $3,594,286. (See report elsewhere in this issue.)

This company, in accordance with its general plan, is making improvements to lower the grades on the road from Analomink, Monroe county, Pa., to High Bridge. On this section the present line will be moved between 500 and 700 ft. from its present location, and three tracks are to be laid. An additional track is to be laid from High Bridge to Henryville, in the Pocono mountains.

DENVER, LARAMIE & NORTHWESTERN.—According to press reports this company, now operating a line from Denver, Colo., north to Milliken, 43.4 miles, has been reorganized and plans are made to build about 200 miles of line north via Greeley. Regular train service, it is expected, will be started about April 20 from Denver, Colo., to Greeley, and about a year later it is expected to have an extension finished to Laramie, Wyo. (Feb. 18, p. 379.)

EL PASO & SOUTHWESTERN.—According to press reports surveys are being made for an extension from Benson, Ariz., northwest via Tucson to Phoenix. (Sept. 10, p. 477.)

GRAND TRUNK PACIFIC.—An officer writes that a contract has been given to J. D. McArthur, Winnipeg, Man., for grading and bridge work on a branch from Regina, Sask., southeasterly for 90 miles. (April 1, p. 918.)

GREAT NORTHERN.—An officer writes that a contract has been given to A. Guthrie & Co., St. Paul, Minn., to build from Surrey, N. Dak., near Minot, southeast to Fargo, 225 miles, and that work will be started at once.

An officer writes that a contract has been given to Morris & Shepard for a branch from Stanley, N. Dak., northwest for 50 miles.

GULF & NORTHWESTERN.—Contracts will probably be let within the next 60 days for work on this line. The projected route is from Oklahoma City, Okla., northwest through Kansas to Sterling, Colo., where connection is to be made with the Union Pacific and the Chicago, Burlington & Quincy. There will be a number of wooden bridges, including one over the Arkansas river at Syracuse, Kan. At the annual meeting to be held in Goodland, Kan., April 12, it will probably be determined to start work on the first 30 miles. The line is eventually to be extended from Oklahoma City south to Denison, Tex. J. B. Dyatt, president, Goodland, and R. B. Ketchum, consulting engineer, Salt Lake City, Utah. (Dec. 3, p. 1107.)

GULF & PROVIDENT CITY.—An officer writes that contracts have been let, but grading will not be started for about 60 days. The projected route is from Pierce, Tex., on the Southern Pacific, north to a connection with an east and west line to be built from Glen Flora, on the Gulf, Colorado & Santa Fe, west to Provident City. The work includes large trestles. Emil Reinbold, chairman and president, Kansas City, Mo.

INTERCOLONIAL.—A contract has been given to A. Kirkpatrick, Antigonish, Nova Scotia, to build a branch between Georges river, Cape Breton, N. S., and Sydney Mines, 9.09 miles. (Feb. 25, p. 429.)

KANAWHA & MICHIGAN.—An officer writes regarding the reports that extensive improvements, including new track, tunneling work and eliminating steep grades, are to be carried out at a cost of $1,400,000, that nothing has been determined as yet, with the exception of the Ohio approach to the Ohio river bridge, on which work is already under way. (April 1, p. 918.)

KINDER & NORTHWESTERN.—Surveys are said to be made and work is now under way building from Kinder, La., to timberlands, 15 miles. Work on the first three miles is said to be finished. A. J. Peavey, president, Shreveport.

LACKAWANNA RAILROAD CO. OF NEW JERSEY.—See Delaware, Lackawanna & Western.

MEMPHIS, DALLAS & GULF.—See Memphis, Paris & Gulf.

MEMPHIS, PARIS & GULF.—An officer writes regarding the reports that contracts will shortly be let for extending this line, that it is undecided when bids will be asked for additional work. The line is in operation from Murfreesboro, Ark., southwest to Ashdown, 41 miles, and is projected from Memphis, Tenn., southwest to Dallas, Tex. Track has been laid on 70 miles. The part of the line to be built in Texas will be known as the Memphis, Dallas & Gulf. The extensions are to have a grade of 1 per cent., with curvature of 3 degs. There will be two steel bridges and five important trestles. (Feb. 4, p. 280.)

MISSOURI & NORTH ARKANSAS.—Betterment work to cost $750,000, it is said, will be carried out by this company on the line between Leslie, Ark., and Helena.

NEVADA ROADS.—Right-of-way is being secured by H. G. Comstock, Reno, Nev., for a line from Reno, south to Lake Tahoe, about 20 miles.

NEW YORK CONNECTING.—A bill has been introduced in the New York state legislature extending the time for commencing work on the bridges for the New York Connecting to January 1, 1911, and providing that the work shall be finished five years from that date. Another bill has also been introduced, which extends the time from January 1, 1911, for five years for the completion of the railway which is to operate over the bridges. The projected route is from the Morris Park yards of the New York, New Haven & Hartford in the borough of the Bronx. The plans call for a large viaduct over Ward's and Randall's islands and bridges over the Harlem and East rivers. The line is to be built jointly by the Pennsylvania and the New York, New Haven & Hartford. (Dec. 10, p. 1168.)

NORTHERN PACIFIC.—A contract is said to have been given to Albert Walker, Bearmouth, Mont., for double-tracking work between Missoula, Mont., and De Smet.

OREGON RAILROAD & NAVIGATION CO.—Plans are said to be made for rebuilding three miles of the main line on the Washington division in Hay canyon, Wash. The improvements are to cost $100,000.

PANAMA RAILROAD.—An agreement has been made whereby the Panama Railroad will start surveys at once for the proposed line from the city of Panama, west to David, in the province of Chiriqui, about 300 miles. When finished the line will be owned by the Panama government. By an arrangement with the United States government the line is to be built by the Panama Railroad Co. (See Panama Roads, Jan. 7, p. 69.)

It is expected to begin the operation of trains over the relocated line between Gatun, Canal Zone, Panama and Gamboa, 24 miles, about May 1. (Dec. 10, p. 1168.)

PENNSYLVANIA SYSTEM.—The record of the mileage of the road on December 31, 1909, shows that the total length of main line on the lines east of Pittsburgh and Erie is 5,305 miles, with 1,825 miles of second-track, 543 miles of third-track, 469 miles of fourth-track and 4,299 miles of company's sidings, a total of 12,441 miles. There was an increase of three miles of second-track, two miles of fourth-track and 48 miles of company's sidings, and a decrease of nine miles of first-track and 27 miles of third-track, a total increase of 17 miles. On the Pennsylvania Lines West of Pittsburgh and Erie the mileage is 2,911 miles of first-track, 1,193 miles of second-track, 184 miles of third-track, 91 miles of fourth-track and 2,339 miles of company's sidings, a total mileage of 6,718 miles. During the year there was an increase of six miles of second, third and fourth-track and 32 miles of company's sidings, and a decrease of three miles of first-track, making a total increase of 35 miles. The mileage of the Vandalia Railroad is: First-track, 924 miles; second-track, 84 miles; third-track, eight miles, and sidings, 643 miles, a total of 1,659 miles. During the year there was an increase of two miles of second-track and company's sidings and a decrease of one mile of first-track, making a total increase of one mile. The grand total of all lines, including those operated by and associated in interest with the Pennsylvania Railroad, is 11,234 miles of

first-track, 3,348 miles of second-track, 760 miles of third-track, 570 miles of fourth-track and 8,185 miles of sidings, a total of 24,097 miles. Of this 6,294 miles of first-track are east and 4,940 miles are west of Pittsburgh and Erie.

PENSACOLA, MOBILE & NEW ORLEANS.—An officer writes that contracts have been let to J. M. Kinney and C. W. Merritt, Pensacola, Fla., for grading four miles of line in Alabama. The work involves the handling of about 30,000 cu. yds. of earth excavation and 30,000 yds. of embankment. The projected route is from Pensacola, Fla., northwest to Mobile, Ala., about 60 miles. Contracts are let for building the entire line. There will be 10 steel bridges and about 2.5 miles of trestle work. L. G. Wilkinson, superintendent of construction, Pensacola.

ROCK ISLAND SOUTHERN.—This company, which operates an 18.5-mile line in Illinois, from Monmouth, east to Galesburg, expects to finish an extension this month from Monmouth north to Rock Island and Moline, about 50 miles. The company plans to build a branch from this extension at Aledo junction, west to Aledo, 10 miles, the work to be finished about July 1.

ROCK RIVER TRACTION.—Surveys are said to be under way for lines in Illinois as follows: Princeton, west via Geneseo, to Rock Island; Geneseo, northeast to Sterling, with a branch from this line at Prophetstown, north to Morrison; Geneseo, southeast to Kewanee, thence southwest to Galesburg, in all about 170 miles. H. W. Cole, president, Geneseo; F. W. Sears, chief engineer, Prophetstown.

SALT LAKE & OGDEN.—See Salt Lake City, Utah, under Railway Structures.

SOUTHERN PACIFIC OF MEXICO.—According to press reports from Mexico, a concession has been granted this company by the federal government to build a branch from Quila, Sinaloa, Mex., to Borado. Construction work is to be started as soon as survey can be made and approved.

TENNESSEE CENTRAL.—An officer writes regarding the reports that surveys have been made for an extension from Harriman, Tenn., south, thence east to Knoxville, about 45 miles, that the company is contemplating some extensions on this line, but nothing has yet been determined in regard to carrying out the work. (March 11, p. 547.)

TENNESSEE TRACTION.—An officer writes that surveys are being made from Memphis, Tenn., northeast via Brownsville and Jackson, to Nashville, 225 miles. W. K. Burton, president; G. E. Bushnell, general manager and chief engineer, Memphis.

WASIOTA & BLACK MOUNTAIN.—A second contract is said to have been given to the Callahan Construction Co., Knoxville, Tenn., for building an additional 27 miles. This company now has contracts to build from Pineville, Ky., on the Louisville & Nashville, in Bell county, northeast via Harlan, to a point in Harlan county, in all about 51 miles. E. R. Keller, general superintendent of the construction company, Harlan.

WAYCROSS & FLORIDA.—Organized in Georgia to build 70 miles in Georgia and an extension into Florida. C. J. Haden, C. E. Johnson and C. R. McCormack, Atlanta, Ga.; G. W. Deen, Waycross, and D. Blalock, Jonesboro, are said to be interested.

WICHITA FALLS & NORTHWESTERN.—An officer writes that a contract has been given to the Texas & Oklahoma Construction Co., T. R. T. Orth, president, Wichita Falls, Tex., for building from Altus, Okla., west to Wellington, Tex., about 60 miles. The railway company is considering the question of building a line from Devol, Okla., north to Lawton, 38 miles, but no definite decision has yet been reached. (March 18, p. 751.)

WYOMING RAILWAY.—An officer writes that contracts are to be let at once for building this proposed line from a point on the Union Pacific, in Wyoming, north via Casper, Buffalo and Clearmont, to a point on the Northern Pacific and the Chicago, Milwaukee & St. Paul in Montana, 358 miles. Maximum grades will be 1 per cent. and maximum curvature 3 degs. There will be about 12,000 cu. yds. of excavation per mile. The work includes putting up a 3,000-ft. trestle. Col. W. C. Dows, president, and W. J. Thom, treasurer, First National bank, Buffalo, Wyo. (Jan. 14, p. 114.)

Railway Financial News.

ATLANTA & WEST POINT.—The Georgia Railroad Commission has given the company permission to issue $1,232,200 additional stock, the proceeds of the sale of which will be used to retire at par the $1,232,200 6 per cent. certificates of indebtedness. The new stock is to be offered to stockholders at par.

CHICAGO, ROCK ISLAND & PACIFIC.—Speyer & Co., New York, have bought from the company and sold here and abroad about $6,750,000 4½ per cent. equipment trust notes, series D, of May 1, 1910, maturing in semi-annual installments of $225,000, secured by equipment costing about $7,500,000.

GALVESTON, HARRISBURG & SAN ANTONIO.—Stockholders are to vote May 23 on the question of authorizing a new mortgage to secure $10,000,000 thirty-year 6 per cent. bonds. The mortgage will be secured on the properties of the former New York, Texas & Mexican; Gulf, Western Texas & Pacific; San Antonio & Gulf; Galveston, Houston & Northern; Gonzales Branch Railroad, which were taken over in 1905, and on the new line from Stockdale, Tex., to Cuero, 47 miles, a total of about 425 miles.

HOCKING VALLEY.—The directors have voted to retire at par April 30 the outstanding $15,000,000 preferred stock. The company has in its treasury about $10,000,000 cash as the result of its sale of stock of the Toledo & Ohio Central and the Kanawha & Michigan. This is the final step in the abandonment of the plan for the consolidation of the Hocking Valley, the Toledo & Ohio Central and the Kanawha & Michigan. Of the $15,000,000 outstanding preferred stock and the $6,000,000 common only about $5,000,000 of the preferred and $2,000,000 of the common were ever deposited under the plan of consolidation.

HOUSTON & TEXAS CENTRAL.—The company has applied to the Texas Railroad Commission for permission to issue $3,000,000 bonds, to be secured by a mortgage on the cut-off line from Mexia to Melieva, 94 miles.

LAKE SHORE & MICHIGAN SOUTHERN.—See New York Central & Hudson River.

NEW YORK CENTRAL & HUDSON RIVER.—The New York Up-State Public Service Commission has authorized this company and the Lake Shore & Michigan Southern to execute a New York Central Lines equipment trust of 1910, providing for the issue of $30,000,000 4½ per cent. equipment trust certificates, to be sold at not less than 97 per cent.

The New York Up-State Public Service Commission has given permission to the New York Central & Hudson River and the Lake Shore & Michigan Southern to make an equipment trust agreement securing $30,000,000 4½ per cent. equipment trust certificates of 1910. The certificates are to be sold at not less than 97.

NEW YORK, ONTARIO & WESTERN.—The New York Up-State Public Service Commission has authorized the company to issue $720,000 4½ per cent. notes dated April 1, 1910, due $36,000 semi-annually up to 1920. Proceeds of the sale of these notes is to be used to pay for seven passenger coaches, 500 forty-ton coal cars and 14 locomotives.

PENNSYLVANIA COMPANY.—See Pittsburgh, Youngstown & Ashtabula.

PHILADELPHIA & WESTERN.—Edward B. Smith & Co., Philadelphia, have made arrangements to buy the property of the Philadelphia & Western. This electric road runs from the Sixty-ninth and Market streets terminal station of the Philadelphia Rapid Transit elevated subway to Stafford, Pa., about 12 miles.

PITTSBURGH & LAKE ERIE.—The annual report of this company shows that in 1909 there was no change in the mileage operated. The road runs from the bituminous coal fields in Fayette county, Pennsylvania, through Pittsburgh to Youngstown, 191 miles. Of its total $10,000,000 stock outstanding at the beginning of the year, $5,000,100 was owned by the Lake Shore & Michigan Southern. Total

operating revenues amounted to $14,838,948 in 1909 as compared with $10,382,620 in 1908; operating expenses totaled $6,419,205 in 1909 and $5,372,668 in 1908. After deducting taxes and deficit from outside operations, operating income amounted in 1909 to $8,214,288 and in 1908 to $4,804,638. Nothing was charged to income account in 1909 for additions and betterments or for additional equipment, while in 1908 $1,135,327 was charged for betterments and $1,608,579 was charged for equipment. In 1909 $1,387,896 was spent for additions to the property and charged to capital account, and $1,214,796 was spent for additions and charged to reserve funds. In November, 1908, stockholders were offered $5,000,000 stock at par to the extent of 50 per cent. of their holdings. The annual report shows all of this stock outstanding, and the annual report of the Lake Shore shows that that company subscribes for its proportional share of new stock. Dividends of 10 per cent. were paid in 1908 and also in 1909. Surplus for the 1909 year after the payment of these dividends amounted to $6,115,605, and to $339,893 in 1908. The total to the credit of profit and loss after the crediting of surplus for 1909 was $16,479,796, and from this accumulated surplus there was declared an extra dividend of $20 per share, calling for the payment of $6,000,000.

Under operating expenses maintenance of way cost $1,496,196 in 1909 and $1,374,007 in 1908; maintenance of equipment cost $1,351,357 in 1909 and $963,976 in 1908. Transportation expenses cost $3,188,159 in 1909 and $2,644,931 in 1908.

Of the total tonnage, 28,232,941 tons, carried in 1909, 9,612,412 tons was bituminous coal. These figures compare with a total tonnage in 1908 of 19,215,998 tons and a bituminous coal tonnage of 7,911,266 tons. Nearly every class of commodity furnished a greater tonnage in 1909 than in 1908. The tonnage of coke carried amounted to 5,731,264 tons in 1909, an increase over 1908 of 2,656,592 tons; and the tonnage of ores amounted to 4,655,487 tons in 1909, an increase of 2,158,271 tons over 1908. The average length of haul of revenue freight was 63.57 miles in 1909 and 65.20 miles in 1908. The average revenue train load was 1,192 tons in 1909 and 1,058 tons in 1908. Total freight revenue amounted to $13,087,637 last year and to $8,840,381 the year before; and the average revenue per ton per mile was 7.29 mills last year and 7.06 mills the year before. Total passenger revenue amounted to $1,337,825 in 1909 and to $1,165,684 in 1908. The December 31, 1909, balance sheet shows total current assets of $11,314,742, of which $8,176,112 was cash; total current liabilities amounted to $1,738,721, of which $646,534 was traffic balances payable and $957,853 audited vouchers and wages unpaid. Under accrued liabilities not due there are $6,750,000 dividends declared, which have since been paid, thus reducing the cash on hand by that amount.

Pittsburgh, Youngstown & Ashtabula.—Stockholders are to vote May 15 on the question of leasing the property to the Pennsylvania Company, which owns $5,775,000 out of a total of $9,100,000 of the preferred stock, and all of the $2,100,000 common stock. President Wood has issued a circular stating the conditions of the lease that the Pennsylvania has agreed to, in part as follows:

(1) The efficient operation and maintenance of your property. (2) The maintenance of the corporate organization. (3) The payment of a guaranteed rental sufficient to pay the interest on your funded debt and other obligations and a dividend of 7 per cent. on your preferred and common capital stock. (4) Betterments to meet, from time to time, the demands of the increasing business, the cost of which shall be represented by capital stock or bonds to be issued by your company, and to bear such rate of dividend or interest as may be satisfactory to the lessee; and (5) the failure to pay the rental provided in the lease, and perform all of the covenants therein contained, for 90 days, shall work a forfeiture of the lease.

Rutland Railroad.—The annual report of this company shows 468 miles of line operated in 1909, the same as in 1908. The road runs from Bellows Falls, N. H., and Chatham, N. Y., to Ogdensburg. A majority of the $9,257,000 capital stock of the company is owned by the New York Central & Hudson River. The total operating revenues in the calendar year ended December 31, 1909, amounted to $3,102,432; this compares with total operating revenues of $2,755,204 in 1908. Expenses amounted to $2,201,845 in 1909 and to $1,981,767 in 1908. Operating income, after the deduction of taxes, amounted to $786,281 in 1909 and to $674,461 in 1908. Nothing was charged from income for additions and betterments or additional equipment in 1909, these charges being made in profit and loss account according to Interstate Commerce Commission rules, while $2,320 was charged for betterments in 1908 and $18,667 for equipment in 1908. The surplus for the year amounted to $204,005, comparing with $71,499 in 1908. After crediting this surplus to profit and loss and making adjustments required by the Interstate Commerce Commission, there was a total to the credit of profit and loss of $1,503,876, of which $585,051 is treated as appropriated surplus, from which it is proposed to buy new equipment at an estimated cost of $227,000, and to spend for improvements $114,057. The preferred stock of the Rutland, amounting to $9,257,000, is a 7 per cent. cumulative stock, on which no dividends were paid in 1908 or 1909. Minority stockholders have complained for a number of years that the management was using funds for other purposes that should properly be paid in dividends to preferred stockholders, and they claim that up to January, 1909, dividends aggregating 179 per cent. were due.

Of the total expenses $468,164 was spent for maintenance of way in 1909 and $392,507 in 1908. There was spent for maintenance of equipment in 1909 $459,687 and $361,526 in 1908. Transportation expenses cost $1,124,892 in 1909 and $1,088,119 in 1908.

The total revenue tonnage in 1909 amounted to 1,993,725 tons and to 1,759,502 tons in 1908. Products of forests other than lumber furnished a greater tonnage than any other commodity, but in 1909 this tonnage amounted to 289,965 as compared with 326,854 tons in 1908. The tonnage of lumber also decreased in 1909 as compared with 1908. The tonnage of bituminous coal, grain and sugar increased in 1909. The average haul per ton of revenue freight was 122 miles as compared with 105 miles in 1908; the average revenue train load was 380 tons last year, an increase of 42 tons over the year before; the average revenue per ton per mile was 7 mills in 1909 and 7.9 mills in 1908. Total freight revenue amounted to $1,721,305 last year and to $1,476,478 the year before; total passenger revenue amounted to $1,043,562 in 1909 and to $972,118 in 1908. The December 31, 1909, balance sheet shows current assets of $1,032,609, of which $419,631 is cash and current liabilities amounting to $778,529, of which $323,000 was loans and bills payable.

St. Louis & San Francisco.—Stockholders are to vote May 16 on the question of making a mortgage on the new New Orleans, Texas & Mexico division to secure $50,000,000 5 per cent. bonds of March 1, 1910-1940.

Southern Railway.—Potter, Choate & Prentice, New York, have purchased $5,200,000 Southern Railway equipment trust 4½ per cent. bonds, dated April 1, and maturing in 20 semi-annual instalments of $260,000 each, October 1, 1910, to April 1, 1920. The security for this issue is equipment of a total cost of $6,322,500, of which amount 17½ per cent. has been paid in cash by the company.

Vandalia.—Speyer & Co., New York, are offering $5,000,000 consolidated mortgage 4 per cent. bonds of 1907-1957 at 97½. These bonds are part of the $10,000,000 series B, which series is part of the total authorized issue of $25,000,000 bonds, of which there is outstanding, including this $5,000,000, $18,000,000. The proceeds of the bond sale are to be used by the railway company to retire $500,000 Terre Haute & Logansport first mortgage 6 per cent. bonds, and to pay for the building of additional second-track and for additional equipment, estimated to cost $4,500,000.

Western Maryland.—An initial quarterly dividend of 1 per cent. has been declared on the $10,000,000 non-cumulative 4 per cent. preferred stock.

About 8 per cent. of the stockholders have voted to ratify the action of the directors in authorizing the sale of the $25,469,670 unissued stock at $50 a share. There were no dissenting votes.

Supply Trade Section.

The King Bridge Co., New York, on April 6 moved its office to room 1040, Hudson Terminal building, 30 Church street.

George W. Fleming, of the Pittsburgh Gage & Supply Co., Pittsburgh, Pa., has been appointed eastern sales manager, with office at 91 Liberty street, New York.

C. P. Williams has been appointed, effective April 1, to succeed E. G. Buchanan, who resigned as the New York representative of the Chicago Railway Equipment Co., Chicago.

George E. Howard has been appointed eastern representative of J. Rogers Flannery & Co., general sales agents of the Flannery Bolt Co., Pittsburgh, Pa., manufacturers of the Tate flexible staybolt.

Work of rebuilding the Denver plant of the Griffin Wheel Co., Chicago, which was burned March 8, is progressing rapidly and it is expected that a portion of the plant will resume operation May 15.

The Scullin-Gallagher Iron & Steel Co., St. Louis, Mo., will, on April 23, move its Chicago office from the Fisher building to suite 1007-1009 of the new People's Gas building, Michigan avenue and Adams street.

A. Munch, formerly secretary of the Northwestern Metal Manufacturing Co., Minneapolis, Minn., has been elected vice-president, to succeed W. C. Schroeder. R. E. Cook, formerly treasurer, has been elected secretary and treasurer.

The McKeen Motor Car Co. has sold one 55-ft. motor car to the Charles City & Western, Charles City, Iowa; one 55-ft. car to the Woodstock-Sycamore Traction Co., Chicago, and one 70-ft. car to the Minnesota Central, Minneapolis, Minn.

During the past several months the Northern Engineering Works, Detroit, Mich., has been placing orders for new tools and machinery, consisting largely of lathes, gear cutters and milling machines, which machinery is now being installed.

The Blue Island Rolling Mill & Car Co., Chicago, has increased its capital stock from $500,000 to $750,000. The new plant which the company is building at Blue Island, Ill., is nearing completion and it is hoped that it will be ready for operation by June 1.

The Isthmian Canal Commission will receive bids until May 2 for lumber, piles and steel castings (Circular No. 571), and until May 3 for cast iron car wheels and car journal bearings, this being the annual estimate for the period ending June 30, 1911. (Circular No. 572.)

Frank McMurdie, superintendent, since 1894, of the Detroit plants of the American Blower Co., Detroit, Mich., has resigned to become general superintendent of the Clarage Foundry & Manufacturing Co., Kalamazoo, Mich. Mr. McMurdie was one of the oldest employees of the American Blower Co., having entered its employ in 1883.

C. T. Alden, an electrical engineer of New York, was, on April 1, made chief engineer and general manager of J. B. Taylor & Co., Inc., New York. Mr. Alden will reorganize and enlarge the business, with the idea of making an engineering and operating company to handle the building and reorganizing of electric and steam railways, gas, water power, irrigation, etc.

The Volkhardt Co., Stapleton, N. Y., desires to arrange with supply companies, having representatives who call upon master mechanics, to handle its line of hydrant cocks and valves in Chicago, St. Louis, Mo.; Detroit, Mich.; St. Paul, Minn.; New Orleans, La.; Denver, Colo.; Seattle, Wash., and San Francisco, Cal. The business which the company has, at the present time, in these cities will be turned over to representatives.

The Ohio Welding & Manufacturing Co., Cincinnati, Ohio, will represent the Davis-Bournonville Co., New York, and has installed a large demonstrating plant, including welding equipment, and an oxygen plant, so as to handle all classes of repair work to which the oxy-acetylene process can be applied. This includes broken or cracked parts in cast iron, steel, aluminum, brass, copper, German silver, platinum, malleable iron, etc. The Davis-Bournonville Co. will also shortly open a demonstrating and repair shop in Cleveland at 2121 East Second street, S. E.

A little over four years ago the Allis-Chalmers Co., Milwaukee, Wis., secured the right to manufacture the Parsons turbine in this country. Only one unit was placed in operation the first year, but since then there has been a steady and rapid growth in sales, until the present total capacity of Parsons turbines in use is over 300,000 h.p. Of this aggregate, 48.2 per cent. were sold during 1909 and 20.6 per cent. have been ordered since January 1, 1910. Forty per cent. of the units have been for use by power, lighting and railway companies, textile manufacturers being next with 14 per cent. of the machines. Practically every type of industry is represented in the buyers of these machines and they are distributed over nearly every state in the Union and also in Canada and Mexico.

The Automatic Cattle Guard Co., Sandpoint, Idaho, advises that its machine shop was completed and all machinery installed about February 15, and that plans are now completed for a concrete foundry building 40 ft. wide and 100 ft. long. The cattle guard made by this company has been sold to a number of roads west of the Mississippi river and in Canada, the orders being filled by contract with firms in Chicago and Spokane, Wash. The machine shop, which is now in operation, has a capacity of 60 guards a day, and when the foundry is completed the entire guard can be made at the Sandpoint plant. It is the intention to build factories in Kansas City and at some point in Canada within the next year, and the establishing of offices in Kansas City is being considered. The officers of the company are: Chas. W. Palmer, president; Geo. W. Cline, vice-president and treasurer; Fred J. Keller, secretary; D. W. Richards, general manager.

TRADE PUBLICATIONS.

Shop Improvements.—The S. A. Woods Machine Co., Boston, Mass., has reprinted, in a two-page leaflet, an editorial from the *Iron Age* entitled Modernizing Old Shops.

Foundry Machinery and Equipment.—The Northern Engineering Works, Detroit, Mich., has just issued booklet No. 93 regarding the foundry, machinery and equipment which it manufactures.

Industrial Railways.—The C. W. Hunt Co., New York, has issued pamphlet No. 101, which is fully descriptive of Hunt industrial railways. The pamphlet contains a large number of illustrations and valuable information on this subject.

Chloride Accumulator.—The Electric Storage Battery Co., Philadelphia, Pa., has just issued bulletin No. 121 containing a very complete description of the installation of the chloride accumulator in the mills of the Indiana Steel Co. at Gary, Ind.

Machinery and Railway Supplies.—The H. Channon Co., Chicago, has issued catalogue No. 50, listing the wide variety of railway machinery and supplies handled by the company. The book is 7 in. x 9½ in., bound in cloth, and contains 952 pages.

Heaters.—The American Blower Co., Detroit, Mich., in bulletin 273, illustrates and describes its ABC sectional base heater, for use in connection with fans and blowers for heating, ventilating and drying. The bulletin also contains a table giving capacities of these heaters.

Generators.—The Western Electric Co., New York, in bulletin No. 5,111 describes its new design of Hawthorne, type LL, multipolar, engine-driven, d.c. generators. A full description of all the details of design and construction is given, along with the merits of the component parts.

Planing Machinery.—The S. A. Woods Machine Co., Boston, Mass., has just issued three small leaflets, one describing its Woods No. 20 high-speed planer with one side drive; another its Woods convertible disk side heads, and the third the new Woods beading or profile attachment.

Waterproofing Materials.—The Barrett Manufacturing Co., New York, has issued a folder carrying a large illustration of the new Pennsylvania Railroad terminal in New York City, with some general information regarding it and the use of coal tar pitch and tarred felt waterproofing used both in the tunnels and the station proper.

Waterproofing.—J. A. & W. Bird & Co., Boston, Mass., has issued, in pamphlet form, an article entitled the Waterproofing of Structures, which has special reference to sub-level construction, the envelope method and the use of tunaloid. The pamphlet also contains an illustrated article regarding the application of tunaloid in the Pennsylvania Railroad tunnels from Long Island City, L. I., to Jersey City, N. J.

Tie Plates.—The Hart Steel Co., Elyria, Ohio, in a catalogue recently issued, describes its several designs of plain and shoulder tie plates, both with flat bottom and with longitudinal and transverse flanges, and also its latest and most efficient types of screw spike plates. The catalogue contains a number of half-tone and line illustrations, together with some data obtained from tests of these plates. These screw spike tie plates were illustrated and described in the *Daily Railway Age Gazette* of March 16.

RAILWAY STRUCTURES.

Baltimore, Md.—See elsewhere in this issue an illustrated article in regard to a union passenger station to be built by the Northern Central.

Birmingham, Ala.—Permission has been granted to the Atlanta, Birmingham & Atlantic, it is said, to put up a stone and concrete freight house, 38 ft. by 349 ft., in Birmingham.

Bridgeport, Tex.—According to local reports, the Rock Island is planning to put up a passenger station at Bridgeport, to cost between $12,000 and $15,000.

Cleveland, Ohio.—The Erie is planning to provide a new draw span to replace the present temporary swing draw over the Cuyahoga river at Cleveland. The channel of the river at this point is to be widened, which will require the installation of a 180-ft. lift span, center to center bearings, to provide a clear width of channel of 120 ft. There will also be one 106-ft. plate girder approach span. New masonry will be put in for the steel work and the bridge will be double-tracked. The consent of the war department and local authorities to make the improvements has been secured. (March 25, p. 853.)

Duluth, Minn.—The Minneapolis, St. Paul & Sault Ste. Marie has completed a new roundhouse in the yards in the west end of Duluth. The structure has six stalls and is built adjoining the small repair shop at Twenty-first avenue and Michigan street. A coal shed and turntable have also been provided.

Fruitvale, Cal.—The Western Pacific has granted the request of the local board of trade for a new station, and plans are being prepared for a combined passenger station and freight house.

Montreal, Que.—See Canadian Pacific under Railway Construction.

Ogden, Utah.—The Harriman Lines are to build three new structures in the local yards, a large shed for housing passenger cars, a depot ice house and a car repair shop. The plans call for the completion of these buildings by October 1 and work is to be begun at once.

Salt Lake City, Utah.—Announcement is made that the Salt Lake & Ogden will put up a large terminal in Salt Lake City, to cost about $50,000. The company expects to have the electrification of this line from Salt Lake City north to Ogden, 35.50 miles, finished and trains in operation to the terminal site in Salt Lake City about May 1. (Oct. 29, p. 832.)

San Antonio, Tex.—The International & Great Northern will build a new boiler shop in San Antonio, to cost about $50,000.

Wilkesbarre, Pa.—According to press reports plans are being made by the county commissioners for a new bridge to be built between Plymouth and Breslau, in Luzerne county, at a cost of about $175,000. It is to be a combined highway and street railway bridge.

Late News.

The items in this column were received after the classified departments were closed.

The Central of Georgia has increased the wages of enginemen 5 per cent.

The Norfolk & Western has made an increase of 6 per cent. in the wages of all employees who receive $155 or less monthly, and who have not received an advance since October 1 last.

The general offices of the Ann Arbor Railroad are to be moved on May 1 from Detroit to Toledo, and the operating offices of the Detroit, Toledo & Ironton from Toledo to Detroit.

Otto H. Kahn, has been elected a director of the Southern Pacific to fill the vacancy in the board occasioned by the resignation of William Mahl at the time of his election as a vice-president of the company.

Judge Robert S. Lovett, chairman of the executive committee of the Union Pacific and the Southern Pacific and president of the Union Pacific, at the regular anuual meeting of the Southern Pacific was formally elected also president of the Southern Pacific.

According to press reports from Wichita Falls, Tex., contracts have been let to build the first 10 miles of the Wichita Falls-Oklahoma City Railway, from Walter, Okla., southwest to the Red river, and contracts for 18 miles, from Wichita Falls, Tex., northeast to the Red river, will be let soon. The line is being built by residents of Walter.

Contracts are to be let at once by the Oregon Trunk Line, it is said, for an extension from Madras, Ore., south to Bend. The line is now under construction from the Dalles, Oregon, on the Columbia river, south through central Oregon to Madras. Contract for the first 109 miles let to Porter Brothers. J. F. Stevens, president, Portland. (Jan. 28, p. 209.)

Emory V. Donelson, of Baltimore, Md., died suddenly on the morning of April 5 on the way from his home to his office. Mr. Donelson was the district representative of the Asbestos Protected Metal Co., of Canton, Mass. He was well known in public life in Baltimore, having been electrical commissioner of that city for a number of years and under his direction the new electrical apparatus was installed after the fire in 1904. He is survived by his widow and two daughters.

A Washington rumor says that the Interstate Commerce Commission has reached a decision in the case brought by George S. Loftus, a commission merchant of St. Paul, against the Pullman Car Company, alleging unreasonable charges, and will probably hand it down within a week or ten days. The commission has not made known its decision, but there is a report that it is against the Pullman Company and that it will mean a reduction in Pullman rates throughout the United States, and that hereafter an upper berth will cost less than a lower one.

The New York Public Service Commission (New York City) has ordered the Long Island Railroad to equip all electric trains either with platform gates or vestibule doors, and to make all station platforms even with the car platforms. The order with regard to the car platforms must be complied with by April 30, and that with regard to the station platforms by June 30. It is understood that the company has already equipped most of its cars with platform gates or vestibule doors, but the order with regard to the station platforms necessitates changes at a number of stations.

A draft of the form of contract for sectional construction by the city, of the Broadway-Lexington avenue subway in the borough of Manhattan, the Broadway-Lafayette subway in Brooklyn and the branches of the Fourth avenue line in Brooklyn, has been agreed upon. These branches will cost about $100,000,000. An alternative form of contract will be drawn. This will permit bidders to build the line with their own money, also to bid for the equipment and the operation

of the proposed lines, and bids will be asked for on both these propositions. As soon as both forms of contract are approved by the board of estimate and the city officials, the Public Service Commission will hold a hearing, which must be advertised for two weeks. It is believed that bids will be asked for the work about May 1, and it is expected that work can be started about a month later.

The executive committee of the Western Union Telegraph "recommends to the board of directors that no increase in the present rate of dividends be made until the plant of the company wherever it may be found necessary is placed in the highest possible condition, the working conditions of the employees improved and their salaries rearranged, recognizing in this readjustment merit, proficiency and length of service modified by location." President Robert L. Clowry, in explanation of the committee's action, said: "All earnings of the company above the present dividend rate of 3 per cent. per annum will be put into the property in order to raise it to the highest standard of efficiency. Wherever renewals of trunk lines are necessary it is our intention to substitute copper for iron wires. This will tend to improve greatly the efficiency of transmission. The speed of transmission of all messages is to be increased by the introduction of additional equipment in offices and additional direct wires between traffic centers."

A press despatch from Philadelphia, received too late to be confirmed, says that when the New York station of the Pennsylvania is opened through long distance competitive passenger fares, as from Buffalo, Cleveland, Chicago, Cincinnati and St. Louis, in other words, from all such points as the Pennsylvania Railroad and the New York Central come into direct conflict for business, will not be changed. On this traffic the company expects to profit by getting a larger share than at present. Between Philadelphia, Baltimore, Washington, Harrisburg, Pittsburgh and other non-competitive points and New York an additional charge will be made to the Seventh avenue terminal. It is said that this will be conservative—that is, that the extra charge over the fare to Cortlandt street will probably be 25 cents, although it may possibly be twice that much. Commutation rates out of New York to New Jersey points will be considerably advanced on tickets good to and from the terminal station. Just how far back this advance will be extended is undecided, but probably it will extend as far back as New Brunswick. The Long Island Railroad will make a small extra charge to and from the New York terminal. This will be $2 a month above the Long Island City basis, or an advance of about 95 cents a month over the railway and ferry basis. All other passengers will pay five cents more for coming into the city station.

Mr. Henry D. Shute has been appointed acting vice-president of the Westinghouse Electric & Manufacturing Co. as of April 1, 1910. For seventeen years Mr. Shute has been associated with this company and his work has been of a character to give him a broad experience in the shop, sales and executive departments. Mr. Shute studied electrical engineering at the Massachusetts Institute of Technology. Following his graduation in 1892, he spent a year studying in Germany at the School of Mines, Clausthal, and also in Dresden. In 1893 he began work with the Westinghouse company at Pittsburgh as an apprentice, spending his first two years in the testing department, following which he spent considerable time on erection work, on laboratory work, under Mr. C. F. Scott, and later as assistant foreman of one of the departments of the works. He subsequently took up designing work on alternating current apparatus, which, in the engineering department, enlarged his experience still more. After five years' service with the company Mr. Shute took up work in connection with the sales department at the East Pittsburgh office, and in 1901 was made the head of the alternating current division, correspondence department. Two years later he was made assistant to Vice-President L. A. Osborne, which position he held at the time of his recent appointment. In this latter position he was active in the developments made in heavy electric traction and particularly in single phase railway work. Mr. Shute is a member of the American Institute of Electrical Engineers and a member of the Engineers' Club of New York.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Iowa Central is in the market for 10 consolidation locomotives.

The Queen & Crescent Route is in the market for 10 Mallet locomotives.

The St. Louis & San Francisco is in the market for 80 Pacific locomotives.

The Chicago & Alton is in the market for 10 Mogul switch, 10 Pacific and 30 Mikado locomotives.

The Chicago, Rock Island & Pacific is in the market for 25 Pacific and 34 consolidation locomotives.

The Minneapolis & St. Louis is in the market for 10 consolidation and two Mogul switch locomotives.

The Chicago Great Western is reported as being in the market for 41 locomotives. This item is not confirmed.

The Arbuckle & Western, Ardmore, Okla., a new line under construction in Oklahoma, expects to buy rolling stock in the near future.

The Wichita Falls Route has ordered three eight-wheel and three consolidation locomotives from the Baldwin Locomotive Works.

The Southern Railway has ordered two Mallet, 38 consolidation, 25 Pacific and 10 six-wheel switch engines from the Baldwin Locomotive Works.

The Wyoming Railway, a line under construction in Montana and Wyoming, is in the market for motive power. W. C. Dows, president, Buffalo, Wyo.

The Elgin, Joliet & Eastern has ordered 25 consolidations, 18 six-wheel switching and two eight-wheel transfer locomotives from the American Locomotive Co.

The New Orleans Great Northern is having two 4-6-0 locomotives built at the Paterson, N. J., plant of the American Locomotive Co. Delivery is specified for April.

CAR BUILDING.

The Northern Pacific is to build 600 box cars in its Tacoma shops.

The Crystal Tank Line is in the market for 100 8,000-gal. tank cars.

The Wichita Falls Route has ordered 75 box cars from Haskell & Barker.

The New Orleans Railway & Light Co., New Orleans, La., is to buy 35 to 50 electric cars.

The St. Louis & San Francisco is contemplating the ordering of 300 to 500 automobile cars.

The Arbuckle & Western, Ardmore, Okla., a new line under construction in Oklahoma, expects to buy rolling stock in the near future.

The National Railways of Mexico have ordered 300 box, 50 stock, 50 flat, 200 gondola and 10 tank cars from the American Car & Foundry Co.

The Wyoming Railway, a line under construction in Montana and Wyoming, is in the market for rolling stock. W. C. Dows, president, Buffalo, Wyo.

The Mexico North Western, reported in the *Railway Age Gazette* of February 25 as being in the market for 260 freight cars, will buy 200 forty-ton box and 60 thirty-ton stock cars.

The Hilo Railway, Honolulu, H. I., has ordered the 10 box cars for which it was reported in the market in the *Railway Age Gazette* of February 25, from the American Car & Foundry Co.

The St. Louis & San Francisco is in the market for two

café-observation and two smoker-observation cars, and has ordered six 70-ft. gasolene-electric motor cars from the General Electric Co.

The Southern Railway, reported in the *Railway Age Gazette* of March 11 as being in the market for 10 combination baggage and passenger cars, has ordered 10 wooden combination coaches from the Hicks Locomotive & Car Works.

The Colorado & Southern, as reported in the *Railway Age Gazette* of March 25, has ordered 500 all-steel dump gondola cars from the Pressed Steel Car Co., and 300 forty-ton box and 200 thirty-ton stock cars from the Mt. Vernon Car Mfg. Co. In addition to these orders one dining car was ordered from the Pullman Co. The orders for the other equipment mentioned in the inquiry reported March 11 will be placed in a short time.

MACHINERY AND TOOLS.

The Marshall & East Texas has ordered from Joseph T. Ryerson & Sons, Chicago, the complete equipment for its boiler shop at Marshall, Tex.

The Pittsburgh & Lake Erie has ordered from the Industrial Iron Works, Bay City, Mich., a 100-ton wrecking crane with a 10-ton lifting magnet. The crane is to be installed in the car repair shops at McKees Rocks, Pa.

The American Car & Foundry Co. has ordered an 18-in. x 24-in. single tandem gas engine and a 250-k.w., 240 to 250-volt d.c. generator for its Huntington, W. Va., plant. The equipment will be furnished by the Allis-Chalmers Co., Milwaukee, Wis.

The Boston & Maine has ordered the electrical equipment for the installation of a motor-driven fan in the Hoosic Tunnel from the Allis-Chalmers Co., Milwaukee, Wis. The order includes a 150-k.v.a., 2,300-volt, three-phase, 60-cycle, 900-r.p.m. synchronous motor to be direct-belted to the fan, three 50-k.v.a. oil-filled, self-cooling transformers to step the current down from 6,600 volts to 2,300 volts, and a 5-k.w. belted exciter.

IRON AND STEEL.

The Chicago City Railway is in the market for 5,000 tons of street railway rails.

The Cleveland Electric Railway has ordered 8,000 steel ties from the Carnegie Steel Co.

The St. Joseph & Grand Island has ordered 2,500 tons of rails from the Illinois Steel Co.

The Milwaukee Electric Railway & Light Co. is said to have ordered 4,500 tons of girder rails from the Pennsylvania Steel Co.

General Conditions in Steel.—Reports indicate that steel orders are being taken at close-to-production rate by practically all of the steel companies. The United States Steel Corporation is understood to be receiving between 35,000 and 40,000 tons per day in orders. During the next six months the equipment companies are expected to be the heavy buyers as orders and inquiries for cars and locomotives have been brisk during the past two weeks. The annual report of the Bethlehem Steel Co., for the year ended December 31 last, just issued, shows a net manufacturing profit of $2,645,457 against $2,020,208 for the previous year.

SIGNALING.

Automatic Signal Costs on the B. & O.

F. P. Patenall, signal engineer of the Baltimore & Ohio, reports the cost of maintenance and operation of his electrically-lighted automatic semaphore block signals for the year 1909 as $100 per blade; and he finds that the system compares favorably with signals lighted by oil lamps, not only in performance but in cost. Between Baltimore and Washington there are 69 lamps. These were lighted and extinguished 1,259,250 times, while on the Metropolitan branch 38 lamps were lighted and extinguished 208,050 times, and during the year there were but nine failures, four being caused by lightning and five by films burning out. This system of electric lighting for signal lamps, patented by Messrs. Patenall and Dryden, has been in use over two years. When burning the lamps consume approximately one-half an ampere of current, and on the Washington branch, where 50 trains are run in each direction daily, this results in each lamp burning 1 hour and 40 minutes each 24 hours. The lamps light upon approach of the trains both day and night.

The territory covered by these 107 signals is divided into five sections, and each section has one repairman and one batterman, no lampman being required.

The cost of repairs and maintenance for these signals for the year was as follows:

Blue vitriol	(41,637 lbs.)	$1,782.05
Zincs (2,804)	$786.54	
Coppers (83)	4.61	
	$791.15	
Less credit scrap, copper and zinc.	567.45	
		223.70
Battery jars (10)		1.10
Repair material		139.46
Batterymen labor (5 at $55 per month)		3,330.00
Repairmen labor (5 at $75 per month)		4,500.00
Supervision.		840.00
		$10,786.31
Pounds of blue vitriol used per signal per month		32.4
Maintenance and operation:		
Cost per signal blade, per annum		$100.00
Cost per signal indication, per annum		50.40
Cost per signal blade, per day		.28
Cost per signal indication, per day		.14

Current for lighting the lamps is obtained from the same source as for operating the motor, viz., six cells of storage battery, charged by 18 cells of gravity for each pair of signals. At interlocking plants, where frequently four signals are operated from the battery in one well, seven cells of storage are used, charged by 21 cells of gravity battery. With this system the wages of five lampmen, equivalent to $225 a month, has been saved.

FOREIGN RAILWAY NOTES.

The Port-Arthur-Dalny Railway has been ceded to Japan and, according to report, the Chinese retain the civil administration of the South Manchuria Railway district.

The selection of a route to connect South Siberia and Altai with the main line of the Siberian Railway is now in the hands of a commission. It is understood that Semipalatinsk will be the terminal point and the point of junction lies between Omsk and Tomsk.

Otto Hagend, who reached the highest rank in the Prussian State railway service and retired from it in 1895, and for the last ten years has been one of the editors of the journal of the German Railroad Union, was killed by an automobile in Nice March 1 last in his 68th year.

Capital has been subscribed by the merchants and gentry in the Chefoo district for the purpose of constructing the Chefoo-Weihsien Railway, for which there has been much agitation during the last two years. Application for registration has been made to the ministry of agriculture, industry and commerce. This line is believed to promise the salvation of Chefoo as a commercial port.

There was recently a meeting held in Leipzig, largely attended by state railway employees, which was addressed by a Social-Democratic delegate to the Saxon Diet, who had been a brakeman. At this meeting the railway men were invited to join a "Railroaders' Union," doubtless of the Social-Democratic stamp. Thereupon the Saxon authorities put up placards at the shops and elsewhere calling attention to the fact that membership in this union, any support of its measures and attending its meetings are prohibited under penalty of dismissal from the state railway service.

ANNUAL REPORT.

EIGHTIETH ANNUAL REPORT OF THE DELAWARE & HUDSON COMPANY: YEAR ENDED DECEMBER 31, 1909.

New York, N. Y., March 31, 1910.

To the Stockholders of The Delaware & Hudson Company:

The President and Managers submit the following statement of the affairs of the Company for the year ended December 31, 1909:

The results from operation of the Coal Department of the Company, were:

	Coal produced and purchased.	Receipts.	Expenses.‡	Net.
1909.....	6,238,653 tons.	$16,340,290.43	$16,133,836.38	$206,454.05
1908.....	6,814,200 tons.	†23,847,116.58	†22,993,999.99	853,116.59
Decrease..	575,547 tons.	$7,506,826.15	$6,860,163.61	$646,662.54

†Includes cost of coal added to stock during year.
‡Including taxes.

The results from operations of the Railroads of the Company were:

	Miles.	Earnings.	Expenses.*	Net earnings.	Percentage of expenses to earnings
1909..	843.46	$19,525,859.46	$11,458,479.58	$8,067,379.88	58.68
1908..	845.26	18,500,731.43	10,811,720.87	7,689,010.56	58.44
Inc....	†1.80	$1,025,128.03	$646,758.71	$378,369.32	0.24

* Excluding taxes.
† Decrease.

The general distribution of the earnings and of the operating expenses of the railroads of the Company was as follows:

	1909.	1908.	Increase or *decrease.*
EARNINGS			
From Coal Fr't Traffic.	$8,311,478.85	$9,106,819.84	*$795,340.99*
From Mdse. Freight Traffic, includes switching..	7,691,617.44	6,162,180.98	1,529,436.46
From Passenger Traffic.	2,834,628.48	2,693,672.13	140,956.35
From Express Traffic ..	205,909.51	189,656.38	16,253.13
From Transportation of Mails.	125,947.74	132,315.96	*6,368.22*
From Miscell. Sources...	356,277.44	216,086.14	140,191.30
Gross Earnings	$19,525,859.46	$18,500,731.43	$1,025,128.03
EXPENSES:			
For Maintenance of Way and Structures	$1,334,546.21	$1,417,318.58	*$82,772.37*
For Maintenance of Equipment	2,598,566.26	2,219,542.60	379,023.66
For Traffic Expenses ..	227,346.94	204,849.29	22,497.65
For Conducting Transportation	6,821,392.37	6,528,112.31	293,280.06
For General Expenses ..	476,627.80	441,898.09	34,729.71
Total Expenses	$11,458,479.58	$10,811,720.87	$646,758.71
Net Earnings from Operation	$8,067,379.88	$7,689,010.56	$378,369.32
Percentage of Expenses to Earnings.	58.68	58.44	0.24

NOTE.—Decreases in *italics.*

GENERAL INCOME ACCOUNT OF THE DELAWARE & HUDSON COMPANY, YEAR ENDED DECEMBER 31, 1909, IN COMPARISON WITH YEAR ENDED DECEMBER 31, 1908.

	1909.	1908.	Increase or *decrease.*
COAL DEPARTMENT:			
Gross Receipts.....	$16,340,290.43	$23,847,116.58	*$7,506,826.15*
Gross Expenses (excluding taxes of $301,421.22)	15,832,415.16	22,701,698.26	*6,869,283.10*
Net Earnings	$507,875.27	$1,145,418.32	*637,543.05*
RAILROAD DEPARTMENT:			
Gross Earnings	$19,525,859.46	$18,500,731.43	$1,025,128.03
Operating Expenses (excluding taxes of $411,468.62)	11,458,479.58	10,811,720.87	646,758.71
Net Earnings from operation	$8,067,379.88	$7,689,010.56	$378,369.32
OTHER INCOME:			
Hire of Equipment	$100,611.50	$275,046.59	*$174,435.09*
Outside Operation .....Dr.	2,684.51	Dr. 1,417.17	Loss 1,267.34
Dividends and Interest on Securities Owned..	1,088,013.71	803,599.38	284,414.33
General Interest and Discount.	504,519.36	375,163.23	129,356.13
Miscellaneous Items	126,283.67	52,283.39	74,000.28
Total Other Income..	$1,816,743.73	$1,504,675.42	$312,068.31
Gross income	$10,391,998.88	$10,339,104.30	$52,894.58
DEDUCTIONS FROM INCOME:			
Rentals	$2,076,265.96	$1,897,628.11	$178,637.85
Taxes	712,889.84	705,330.93	7,558.91
Interest on 1st and Refunding Mort. Bonds (1943)	542,253.89	243,998.34	298,255.55
Interest on 1st Mortge. Bonds (1917)	350,000.00	350,000.00	.....
Interest on The D. & H. Co. Debenture Bonds (1916)	559,061.67	559,080.00	*18.33*
Interest on 1st Lien Equipm't Bonds (1922)	450,000.00	450,000.00	.....
Interest on Car Trust Bonds (1909)	2,625.00	7,875.00	*5,250.00*
Interest on Equipment Debenture Bonds (1914)	$36,000.00	$44,000.00	*$8,000.00*
Interest on Divisional Bonds	75,000.00	75,000.00	.....
General Interest and Discount.	392,678.44	707,299.73	*$14,621.29*
Miscellaneous Items.....	384.14	44,433.83	*44,049.69*
Total Deductions	$5,197,158.94	$5,084,645.94	$112,513.00
Net Income Carried to General Profit and Loss..	$5,194,839.94	$5,254,458.36	*$59,618.42*
Percentage to Capital Stock	12.22% on $42,501,000.00	12.39% on $42,400,000.00	.....

NOTE.—Decreases in *italics.*

FINANCIAL.

The Balance Sheet shows an increase in Liabilities of $2,338,628.73, the principal changes being as follows:

Capital Stock.

Additional Capital Stock of The Delaware and Hudson Company to the amount of $101,000 was issued during the year, in exchange for $1,000 The Delaware and Hudson Company Debenture Bonds of 1916 and $201,000 The Albany & Susquehanna Railroad Company First Mortgage Bonds.

Funded Debt.

The Public Service Commission having approved the issue by the Company of additional First and Refunding Gold Bonds to the amount of $7,395,000, the bonds were issued and sold during the year. The Company realized from the sale $7,108,991.25. The discount of $286,008.75 was charged to General Profit and Loss Account.

In accordance with the Equipment Trust Indenture, dated June 1, 1907, $650,000 was paid the Trustees on July 1, 1909.

By the payment of $150,000, due May 15, 1909, the Car Trust Certificates of 1909 were entirely paid off. The indenture has been canceled of record, and title in the equipment covered thereunder has been transferred to this Company.

The amount of Debentures of 1914 shows a reduction of $200,000, the bonds maturing January 1, 1909, having been retired during the year under the provisions of their issue.

The amount of Debentures of 1916 shows a reduction of $1,000, one bond having been exchanged for Capital Stock of The Delaware and Hudson Company.

Floating Debt.

The Floating Debt of the Company decreased $4,175,000 during the year.

Dividends.

On December 29, 1909, a dividend for the year 1910, upon the outstanding $42,501,000 of Capital Stock of the Company, was declared out of the earnings for the preceding years at the rate of nine (9) per cent. upon the par value thereof, and amounting in the aggregate to $3,825,090, payable as follows:

Two and one-quarter (2¼) per cent. upon the Capital Stock in favor only of the stockholders of record upon February 26, 1910, and payable upon March 21, 1910.

Two and one-quarter (2¼) per cent. upon the Capital Stock in favor only of the stockholders of record upon May 28, 1910, and payable upon June 20, 1910.

Two and one-quarter (2¼) per cent. upon the Capital Stock in favor only of the stockholders of record upon August 30, 1910, and payable upon September 20, 1910.

Two and one-quarter (2¼) per cent. upon the Capital Stock in favor only of the stockholders of record upon November 29, 1910, and payable upon December 20, 1910.

GENERAL REMARKS.

Coal Department Operations.

The collieries and washeries of the Company were idle a portion of the year on account of the general depression in the coal business; they produced 6,199,042 tons of anthracite coal out of a total of 61,969,885 tons produced in the region.

The Coal Department expenses include construction and betterments amounting to $726,313.46.

Taxes of the Coal Department for the year 1909 increased $9,119.49.

On June 1, 1909, a contract was made with The Hudson Coal Company by which that Company purchases outright, at the pit-mouth, all the coal produced from the mines belonging to this Company.

Coal Department Relief Fund.

The report of the Coal Department Relief Fund for the year ending December 31, 1909, is as follows:

RECEIPTS:		
Balance on hand, January 1, 1909.....		$2,782.37
Contributed by employees in 1909.....	$10,983.94	
Contributed by The Delaware and Hudson Company, 1909.....	6,987.80	
		17,971.74
TOTAL		$20,754.11
DISBURSEMENTS:		
Accident death benefits.....	$2,044.46	
Accident disablement benefits.....	11,349.00	
		13,393.46
BALANCE ON HAND DECEMBER 31, 1909.....		$7,360.65

These funds were authorized by vote of the stockholders on May 10, 1887, since which time the benefits paid have amounted to $313,029.90, to which the Company contributed $157,940.16.

Railroad Department Operations.

The earnings from Coal Freight traffic decreased $795,340.99, largely due to the general depression in the coal business during the latter part of the year. The earnings from Merchandise traffic increased $1,529,436.46; and from Passenger traffic increased $140,956.35.

The ratio of expenses to earnings for the year 1909 shows an increase of 24-100ths of 1 per cent. over 1908.

The expenditures during the year on account of additions and betterments of the Company's railroad amounted to $720,458.99. This included $50,797.29 for continuing the work of strengthening bridges

on the Susquehanna and Pennsylvania Divisions, $222,071.91 for additional right of way, and $136,046.83 for additional main and side tracks.

A contract has been entered into with the American Locomotive Company for the purchase of six Mallet Articulated Compound Locomotives. These locomotives will be delivered early in the year 1910.

The extension of The Quebec, Montreal and Southern Railway from Pierreville to Fortierville (formerly Ste. Philomene) was completed and put into operation June 14, 1909. The work of extending the line from Fortierville to Levis (opposite Quebec) is held in abeyance because of the destruction of the Quebec Bridge while in course of erection. The Dominion Government has arranged to take over this work, and it is believed that contracts for a new bridge over the St. Lawrence River will be awarded during the year 1910.

Electric Railway Earnings.

The earnings of the electric lines show a substantial improvement, the several roads showing increases in the net earnings as follows: United Traction Company, $141,772.55; Hudson Valley Railway Company, $32,573.03; Troy and New England Railway Company, $12,477.97; Schenectady Railway Company (including Electric Express Company), $110,659.91, and Plattsburgh Traction Company, $1,394.47.

Dividends of 4 per cent. for the year 1909 were declared on the Capital Stock of the United Traction Company, the Schenectady Railway Company, the Troy and New England Railway Company and the Plattsburgh Traction Company.

Mechanicville Power Plant.

The earnings of the Mechanicville Power Plant for the year were $86,031.43, an increase of $59,908.87 over 1908. This power plant develops 3,000,000 K. W. hours per month with 4,000 K. W. installed; and the buildings, foundations, etc., are arranged for the installation of 6,000 K. W. additional.

The Fort William Henry Hotel Company.

During the year the Company purchased the entire outstanding capital stock of The Fort William Henry Hotel Company.

This property consisted of about twenty (20) acres of land, a summer hotel and outbuildings erected thereon, together with furniture and other personal property, all situated in the Village of Lake George, Warren County, New York, at the point of interchange of traffic between the Company's railroad and the steamers of The Lake George Steamboat Company.

On June 24, 1909, as it was about to open for the season, the hotel and contents were totally destroyed by fire. The loss was covered by insurance.

The tourist business to and through Lake George suffered some loss in 1909, which is believed to have been due largely to insufficient hotel accommodations.

Arrangements are now being made to rebuild the hotel.

Litigation.

The litigation referred to in the Company's last Annual Report in reference to the so-called Commodity Clause added to the Interstate Commerce Act in 1906, was terminated during the year by the decision of the United States Supreme Court to the effect that the said Commodity Clause did not prevent carrier corporations from transporting, in interstate commerce, coal which they had originally mined but which they had sold before such transportation, nor prevent a carrier corporation from transporting in interstate commerce coal belonging to a coal company some or all the shares of the capital stock of which were owned by such carrier. Since this company sells in the State of Pennsylvania all the anthracite coal produced from its mines it can therefore lawfully transport such coal on its railroads.

The judgment against this company in favor of The Albany and Susquehanna Railroad Company and its stockholders, referred to in the last Annual Report, was affirmed upon appeal, and this judgment was duly paid and satisfied by the Company. The result of this litigation is that this Company does not receive the benefit, to which its Managers had believed it to be entitled, from the saving of interest, amounting to $120,750 annually, effected by the refunding at 3½ per cent., in the year 1906, of $3,450,000 7 per cent. Bonds of The Albany and Susquehanna R. R. Co. Bonds then maturing, but the saving thereby effected goes to The Albany and Susquehanna R. R. Company. This Company, however, does receive the benefit of the saving of 3½ per cent. annually then effected by the refunding of the remaining $7,050,000 of the $10,000,000 issue of The Albany and Susquehanna R. R. Co. Bonds. Under the judgment the Company paid $1,350,512.36 back rentals, which amount was charged to General Profit and Loss Account. The Company owns about 13 per cent. of the stock of The Albany and Susquehanna R. R. Co., and to that extent will participate in the distribution of the saving effected through the refunding of the 7 per cent. bonds.

The litigation in respect to the contract under which this Company is operating the Ticonderoga Railroad, about 1.41 miles in length, is still pending upon appeal taken by this Company against an adverse decision of a Referee.

During the year the Supreme Court and the Court of Appeals each unanimously reversed the order of the Public Service Commission of the Second District, State of New York, refusing to approve the issue by the Company of its First and Refunding Mortgage Bonds, for the purpose of discharging its obligations incurred in the purchase, in 1906 and 1907, of certain coal lands and traction lines, and thus permitted the Company to carry out its original plans in this respect.

On October 27, 1909, Mr. R. S. Lovett was elected a member of the Board to fill the vacancy caused by the death of Mr. Edward H. Harriman

By order of the Board of Managers,
L. F. LOREE,
President.

FREIGHT TRAFFIC STATISTICS—YEARS 1909 AND 1908.

ALL COMMODITIES.	Year 1909.	Compared with 1908. Increase.	Decrease.
Miles of road	843.46	.....	1.80
Freight earnings	$15,938,522.51	$709,764.73	.....
Per cent. of total earnings.	81.628	.....	.686
Number of tons carried	17,817,464	207,754	.....
Number of tons, one mile.	2,391,053,458	256,309,159	.....
Average miles each ton was carried	134.20	12.97	.....
Number of tons carried per mile of road	21,124	.291	.....
Number of tons carried one mile per mile of road	2,834,815	309,267	.....
Freight earnings per mile of road	$18,896.60	$879.95	.....
Average earnings per ton	.89454	.0298	.....
Average earnings per ton per mile	.0067	.....	.0004
Average number of tons loaded in car	24.28	.....	0.21
Average train loads (tons)	414.66	16.97	.....
Average number of loaded cars in train	17.08	0.84	.....
Average number of empty cars in train	8.40	.....	0.76
Revenue fr't train mileage	5,766,286	398,414	.....
Revenue freight train mileage per mile of road	6,836	.485	.....
Freight earnings per revenue freight train mile.	$2.7641	.....	.0729

BALANCE SHEET.

ASSETS.

	1909.	1908.	Increase.	Decrease.
Unmined Coal, Owned and Controlled	$18,462,664.86	$18,594,577.83	.....	$131,912.97
Advances on Unmined Coal	542,425.78	501,547.87	$40,877.91	.....
Real Estate	5,150,124.36	4,987,228.35	162,896.01	.....
Road and Equipment—The D. & H. Co.	47,839,824.94	47,253,235.83	586,589.11	.....
Road and Equipment—Canadian Lines	6,271,702.56	5,662,851.22	608,851.34	.....
Marine Equipment	9,880.00	9,940.00	.....	60.00
Coal Department Equipment, Cars, Motors, Mules, Horses, etc.	1,074,724.82	1,022,411.24	52,313.58	.....
Coal Handling and Storage Plants	267,476.43	273,447.27	.....	5,970.84
Stocks and Bonds	23,588,805.57	23,364,060.57	224,745.00	.....
Cash	1,850,765.48	830,919.34	1,019,846.14	.....
Fire Insurance Fund	286,536.26	249,142.49	37,393.77	.....
Equipment Trust Fund	673,404.79	12,852.55	660,552.24	.....
Supplies on Hand	2,481,726.84	2,920,837.73	.....	439,110.89
Coal on Hand	*	1,283,206.09	.....	1,283,206.09
Bills and Accounts Receivable	5,803,757.70	4,373,277.51	1,430,480.19	.....
Advances for Construction and Acquisition of New Lines	1,306,218.85	2,377,593.64	.....	1,071,374.79
Total	$115,610,039.24	$113,717,129.53	$1,892,909.71	.....

* Included in Bills and Accounts Receivable for 1909.

LIABILITIES.

	1909.	1908.	Increase.	Decrease.
Capital Stock	$42,501,000.00	$42,400,000.00	$101,000.00	.....
Bonds as follows:				
1st and Refunding Mortgage Bonds, 1943, 4%	$20,704,000			
1st Mtge. Bonds, 1917, 7%	5,000,000			
The Adirondack R'y Co. 1st Mtge. Bonds, 1942, 4½%	1,000,000			
Schenectady & Duanesburgh R. R. 1st Mtge. Bonds, 1924, 6%	500,000			
The D. & H. Co. Debentures, 1916, 4%	13,976,000			
1st Lien Equipment Bonds, 1922, 4½%	10,000,000			
Equipment Debentures, 1914, 4%	900,000			
Total Bonds	52,080,000.00	45,036,000.00	7,044,000.00	.....
Loans Payable	4,325,000.00	8,500,000.00	.....	$4,175,000.00
Interest, Dividends, etc., Accrued	1,076,951.67	613,784.67	463,167.00	.....
Interest, Dividends and Bonds due and not yet collected	178,554.60	193,601.10	.....	15,046.50
Accrued Taxes	106,273.52	112,041.16	.....	5,767.64
Sinking Fund	1,201,538.87	805,454.55	396,084.32	.....
Audited Vouchers and Pay Rolls	2,840,346.86	3,611,577.61	.....	771,230.75
Other Accounts Payable	220,888.22	919,465.92	.....	698,577.70
Total Liabilities	$104,530,553.74	$102,191,925.01	$2,338,628.73	.....
General Profit and Loss, being excess of Assets over Liabilities	11,079,485.50	11,525,204.52	.....	$445,719.02
Total	$115,610,039.24	$113,717,129.53	$1,892,909.71	.....